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PRESCRIPTIONS

—AND—

HOW TO USE THEM.

AN ANATOMICAL AND PHYSIOLOGICAL TREATISE

—ON THE—

HUMAN · BODY

WITH A PRACTICAL DESCRIPTION OF ITS

DISEASES

THEIR SYMPTOMS AND TREATMENT.

"For life is not to live, but to be well."—MARTIAL.

ANATOMY AND PHYSIOLOGY
BY PROF. GEORGE HENCKEL.

DISEASES AND THEIR TREATMENT
BY ORVILLE JUAN PERKINS, M. D.

VOLUME I.

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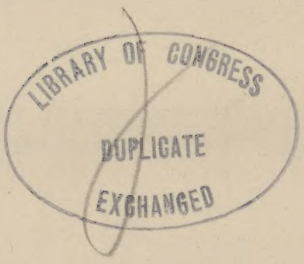
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PREFACE.

While preparing the following pages, we have had constantly in view a desire to make the work one which should be of practical utility. How well we have succeeded, our readers must judge. Hitherto medical works for home use, have devoted more space to the description of the remedies used than to the disease treated. We have reversed this plan, and given the space usually allotted to medicines, to a description of the *symptoms* and *causes*, appending as a remedy, a properly prepared prescription, which is quadruplicated in Vol. III. This we believe a valuable feature. We have also recognized the importance of medical advice, and have striven to make it clear *when to call a physician* as well as to describe the diseases which are safely treated without one. Knowing that nursing is of as great value in appeasing offended nature as medicine, we have devoted considerable space to this important subject in addition to specific directions given under many diseases.

Our aim is to educate, and to this end we have endeavored to present a comprehensive description of the human body, its organs, their functions, with such hygienic instructions as will enable our readers to preserve these various organs in the best possible condition. The public schools have done, and are doing, a grand work in the line of physiological instruction, but unfortunately, at the time when the adult population were in school this branch was not taught. This class—and they are in a large majority—will be directly benefited by a thorough study of Part I of these volumes. The student who wishes to pursue the subject beyond what is taught in the school, is here furnished with an appropriate means for so doing.

We do not anticipate any antagonism from the medical fraternity, as the purpose of the *true* physician is as much to prevent disease as to cure it, and we feel satisfied that these pages will meet the approval of this class. As to the other, the reader will find our opinion of them expressed at various places through these volumes. For the former class we have nothing but words of praise; within

their ranks are the most self-sacrificing, tender-hearted, sympathetic members of society. They stand alone among all others, striving with might and main to extinguish their own business. They preach temperance, virtue and cleanliness, knowing well that when the people come to practice these virtues, their occupation will be gone. If those engaged in other professions and lines of business, gave as much of their labor in charity as doctors do, poverty would be a thing of the past.

Dr. Richardson, a gentleman who stands high in medical ranks, says that seventy per cent. of all diseases could be treated without calling a physician, provided the people would study their causes, symptoms, etc., and the hygienic measures for their prevention. To assist in educating the masses to this standard is certainly an object worthy the best efforts of the most ambitious. We realize, however, that the task is an arduous one; that customs and habits long established must be overcome. "Utopia" is a long way off, and "Hygiea" is a most fickle goddess. It is however, desirable that we should aim to make the teachings of physiological science the precepts of our daily life and conduct. We may not be able to reach our ideal, but progress will be advanced by striving to make its attainment an object.

"Modern science and humanity have done a great deal to keep off disease, and bring down the average death rate in favored communities. Why should it not be so? If life is the due harmony between internal and external conditions of our being, whatever helps the proper adjustment by keeping off external or internal disturbance, must strengthen or prolong life. In a certain sense all nature is our enemy, and earth, air, water, all elements and creatures, are watching to find our vulnerable point. Now all true science is the triumph of the human spirit over the tyranny of nature, and all the sciences and arts of health, all safeguards against infection by proper management of water courses and miasmatic grounds, all preventive measures against the great contagions that ravage the earth, not only save individual lives, but keep evil germs out of the human constitution, and act upon the general vitality of the race. So, too, all efforts to act wisely upon the springs of conduct and character, to promote the domestic virtues of order and purity, the proper care of infant children, the thrift of the laboring classes, the due training of youth in a wholesome round of activity and recreation, tend to prolong life in the community where the efforts are made, and to tell to a certain extent upon the sanity of the nation and the race."

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PART FIRST

Anatomy and Physiology.

BY

PROF. GEORGE HENCKEL.

INTRODUCTION.

HUMAN ANATOMY AND PHYSIOLOGY.

Anatomy is the science which treats of the structure of organic bodies, and *Physiology* is the study of the phenomena of living organisms.

These branches of science make us acquainted with the processes incidental to, and characteristic of life. Also the conditions, manifestations, changes and results of life, including the mechanism of, and chemical alterations in the body, are revealed to mankind, through the researches which have been made in the field of these sciences.

They also teach us all that can be known of the living organisms in a state of activity, with the different parts performing their appropriate functions, and these, as a whole, exhibit the character of individuality and life.

The entire body is a composite structure, made up of many parts, with varied characters and properties, and the life of the organism as a whole depends on the combined activity of its different parts.

Therefore, in studying its functions, we must lay aside previously formed ideas, simply for the purpose of comparison, and consider the living body as a machine.

Anatomy and Physiology go hand in hand, and from them we may learn:

The construction of the body, in whole and in part.

Its mechanism.

The materials with which it is supplied.

The chemical changes which take place in its internal nutrition.

And the phenomena exhibited in every department of vital operations.

The human body is to be used, but when it is misused, consequences ensue, which are commonly called *Disease.*

In order to ward off, or combat disease, a knowledge is necessary of that most wonderful chemico-mechanical machine, *The Human Body.*

To impart this, is the sole aim of the first part of this volume.

The old Romans had a saying, "*Homo sum; humani nihil a me alienum puto,*" meaning "I am a man, and deem nothing that relates to man a matter of indifference to me."

If you take this as one of your precepts, you will be a better, wiser and healthier member of the human family.

CHAPTER I.

Every civilized human being, babies and imbeciles excepted, knows of the legend, that a certain one of our ancestors was created out of *clay*, and for this reason, it is perhaps proper in describing the human body, to commence with that part of it, which partakes of earthy matter, to such a wonderful degree in its composition.

BONE.

Structure and Physical Properties. This part of the human anatomy is a very hard mass, possessing a certain degree of toughness, and is not entirely void of elasticity.

In a fresh state, its color is of a pinkish white on the outside, and deep red within. On examining a section of any animal's bone, it is seen to be composed of two kinds of tissue, one of which is dense and *compact* in texture like ivory; the other consists of slight fibers which join and form a latticework-like structure, and is called the *cancellous* tissue. The compact tissue is always on the external part of the bone, while the latter, or cancellous tissue, forms the internal part.

Bone during life is permeated by vessels and is inclosed in the *periosteum.*

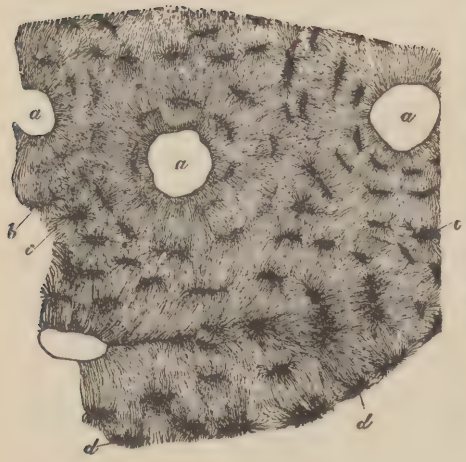
The Periosteum, which means according to Webster, "round the bone," is a membrane of fibrous connective tissue, which closely invests all bones except at the articular surfaces or joints. It is in the periosteum

where the bloodvessels are ramified, previous to their distribution in the bone.

The Marrow not only fills up the cylindrical cavities of the long bones, but also occupies the spaces of the cancellous tissue.

The Bloodvessels of bone are very numerous. As said before, they are ramified in the periosteum, from which membrane they pass into small orifices of the compact tissue, running thence through the canals therein, and which traverse its substance.

The Minute Anatomy of the bone structure is most easily studied and comprehended by looking at the illustrations given here upon that subject, as well as the explanatory notes in connection with them.



Engraving No. 1.

Transverse section of the shaft of the Humerus. Magnified 350 times.
a. Haversian canal. *b*, *c*, *d*. Lacunæ.



Engraving No. 2.

Longitudinal section from the shaft of the Femur. Magnified 100 times.
a. Haversian canals. *b*, and *c*. Lacunæ.

Chemical Composition. Bone consists of an animal and an earthy part, intimately connected together.

The animal part of a bone may be obtained by immersing the bone for a considerable time in diluted hydrochloric acid, after which process, the bone comes out exactly the same shape as before, but perfectly flexible, so that a long bone, for instance the rib of a sheep or hog, can easily be tied in a knot.

The earthy part may be obtained separate by calcination, by which the animal matter is completely burnt out. After this process, the bone will retain its original form, but white in color and very brittle. It also loses by it about one-third its original weight, and will easily crumble.

The earthy matter confers on bone its hardness and rigidity, and the animal matter its tenacity.

The organic constituents of bone forms one-third; the inorganic matter two-thirds or 66⅔ per cent., as seen in the following analysis by *Berzelius*, the Nestor of chemistry.

Organic Matter, such as gelatine and bloodvessels,		33.30
Inorganic or Earthy Matter,	Phosphate of Lime,	51.04
	Carbonate of Lime,	11.30
	Fluoride of Calcium,	2.00
	Phosphate of Magnesia,	1.16
	Soda and Chloride of Sodium,	1.20
		100.00

From the above it will be seen that lime forms over 62 per cent. of its component parts.

Some difference, however, exists between the two constituents of bone, organic and inorganic or earthy matter, at different periods of life. In the child the animal matter predominates, whereas in aged people the bones contain a larger proportion of earthy matter, and the animal matter is deficient in quantity and quality. Hence in children it is not uncommon to find after an injury to the bones, that they become bent or only partially broken, whereas in old people the bones are more brittle, and fracture takes place more readily. Some of the diseases also to which bones are liable, mainly depend upon the disproportion between

THE HUMAN SKELETON.

Explanation of numbers on engraving.

There are two hundred bones in a human skeleton, divided as follows:

Skull, 22 Bones.

		No. of Each.			No. of Each.
No. 1.	Occipital	1	No. 8.	Inferior Maxillary	1
" 2.	Parietal	2	Invisible on Engraving.	Sphenoid	1
" 3	Frontal	1		Ethmoid	1
" 4.	Temporal	2		Lachrymal	2
" 5.	Nasal	2		Palate	2
" 6.	Upper Jaw	2		Inferior Turbinated	2
" 7.	Malar	2		Vomer	1
					22

Spine, 26 Bones.

No. 9.	Cervical Vertebræ	7	No. 11.	Lumbar Vertebræ	5
" 10.	Dorsal Vertebræ	12	" 12.	Sacrum	1
	(seven are hidden by sternum.)		" 13.	Coccyx	1
					26

Miscellaneous, 26 Bones.

No. 14.	Hyoid or tongue bone	1	No. 16.	Ribs	24
" 15.	Sternum	1			26

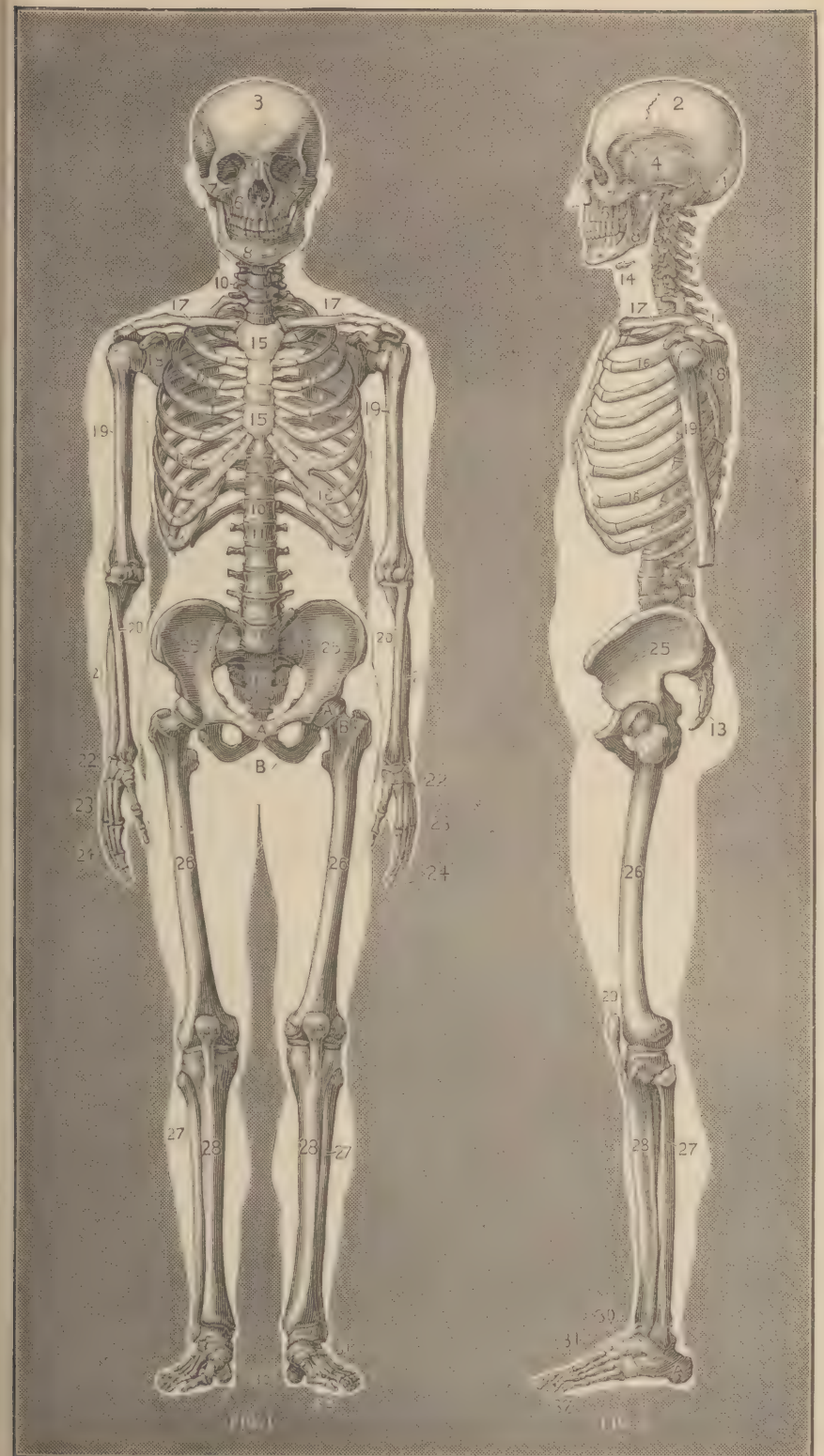
Upper Extremity, 64 Bones.

No. 17.	Clavicle or Collar Bone	2	No. 21.	Ulna	2
" 18	Scapula or Shoulder Blade	2	" 22.	Carpal or Wrist	16
" 19.	Humerus	2	" 23.	Metacarpal	10
" 20.	Radius	2	" 24.	Phalanges or finger bones	28
					64

Each wrist has eight carpal bones, named as follows: Scaphoid, semilunar, cunciform, pisiform (all in upper row), trapezium, trapezoid, os magnum and unciform (in lower row).

Lower Extremity, 62 Bones.

No. 25.	Innominate (A, Pubes; B, pubic arch)	2	No. 28.	Tibia	2
" 26.	Femur or Thigh (A, head; B, neck)	2	" 29.	Patella, or Knee-pan	2
" 27.	Fibula	2	" 30.	Tarsal (A, heel bone)	14
			" 31.	Metatarsal	10
			" 32.	Phalanges	28
					62


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the two constituents of bone. Thus in the diseases called *rickets*, so common with certain children, the bones become bent and curved from the weight of the body upon them. This shows plainly that if the bones were constituted chemically correct, this curvature and excessive flexibility could not take place.

The aggregation of all the bones in the human body, when in their relative position forms a framework, harboring in its cavities, and having attached to it the softer parts, and constitutes, what is usually called:

THE SKELETON.

The entire skeleton in the adult consists of two hundred distinct bones. Their regional classification is as follows:

Spine	26	bones.
Skull	22	"
Tongue bone, Sternum and Ribs	26	"
Upper Extremities	64	"
Lower Extremities	62	"
	200	

Special attention is invited to the full page engravings of the human skeleton, giving front and side view, together with the index of the names of the different bones.

Bones are divided into four classes, Long, Short, Flat and Irregular.

Long Bones are found in the limbs, where they form a system of levers, which have to sustain the weight of the trunk and to confer the power of locomotion. The bones belonging to this class are the humerus, radius, ulna, femur, tibia, fibula, metacarpal, metatarsal and phalanges. The clavicle or collar bone also belong to this group.

Short Bones are found in that part of the body where strength and compactness are required, and not much motion. To this class belong the carpal, tarsal and some of the bones of the skull.

Flat Bones are those where the principal requirement is either an extensive protection, or the provision of broad surfaces for the attachment of muscles, tendons, etc. Among the flat bones are counted nearly all the bones of the skull, shoulder blade, bones of the pelvis, except the backbone part, breast bone and ribs.

Irregular Bones are those which, owing to their shape, are not classed in the foregoing divisions. To these belong the different back bone joints or vertebræ, some of the bones of the skull and the hyoid or tongue bone.

The Spine is a flexous and flexible column formed of a series of bones, called *vertebræ*. There are thirty-three different bones in this column; they are divided into five different classes:

1. *Cervical Vertebræ*, or those of the neck, and are seven in number. The first or upper bone is called the "*Atlas*," so named from supporting the globe of the head, surely a proper one, as it sustains in some persons quite a burden. The second joint is called the "*axis*," so named because it forms a pivot upon which the head rotates

2. *Dorsal Vertebræ*, or those of the back are twelve in number.

3. *Lumbar Vertebræ*, or those pertaining to the loin, are five in number, and are the largest segments of the spine, probably owing to the fact that they have not the support of the ribs, like the dorsal vertebræ.

4 and 5. *Sacral* and *Coccygeal Vertebræ* consist at an early period of life, of nine separate pieces, which are united in the adult, so as to form two bones, five entering into the formation of the *sacrum* and four into that of the *coccyx* bone. The latter is the last joint of the spine and is so named because it has the shape of a "cuckoo's" beak, of which the word coccyx is a Greek translation.

In this connection it is perhaps proper to speak of the lateral curvatures in the spine (looking at the back), the convexity of which is directed to the right side generally, and sometimes to the left, as will be explained.

This curvature in the spine has caused many a mother moments of terrible anxiety, under the belief that her offspring was about to enter into the battles of life with an ill-shaped body. However, no fear need be anticipated, for it is only the common course of nature, and is very nicely explained by M. Bichat, a celebrated French scientist, who says that it is produced by muscular action, as soon as this comes into play by a child. Most persons using the right arm in preference to the left, especially in making long continued efforts, when the body is curved to the right side. In support of this explanation, it has been found that in left-handed individuals the lateral curvature is directed to the left side.

The Skull. This part of the skeleton surely needs more than passing notice, for is it not the harboring place of the brain, —the seat of the sensibilities,—the superiority of which makes man the ruler of the animal kingdom?

By studying this expansion of the vertebral column, our thoughts must go out in adoration to the Maker for the provident care, with which this part was designed to withstand contusion; the dome-like construction protecting the vital parts contained therein, like a cuirass.

The skull is usually divided into two parts, namely the *cranium* (a helmet), and the *face*. The former is composed of eight, while the latter has fourteen bones. The teeth and the chain of bones of hearing are not, however, included in this enumeration, and are not classed with the bones at all.

Cranium, eight Bones.	Occipital	1
	Parietal	2
	Frontal	1
	Temporal	2
	Sphenoid	1
	Ethmoid	1
Face, Fourteen Bones.	Nasal	2
	Upper Jaw	2
	Lachrymal	2

Face, Fourteen Bones.	Malar	2
	Palate	2
	Inferior Turbinated	2
	Vomer	1
	Lower Jaw	1
		22

Soft Spots or Fontanels. At the places where the seams or sutures are noticed in the cranium, as shown in the engraving of the skeleton, openings exist at time of birth. The anterior soft spot is usually the largest; the posterior about at the center of the scalp, is smaller. The lateral fontanels are on the sides. The last mentioned two close up soon after birth, the posterior in about two months and the anterior often remains open during the first and second year; if prolonged however, beyond the latter period, it is liable to be persistent throughout life and somewhat indicative of water head. In very early life the pulsations of the brain are perceptible, and are likened to the rising of water in a fountain, hence its name --fontanels—fountains.

Sutures or Seams. When these fontanels become closed and ossified, interlocking into one another, they form sutures. These sutures remain separate for a considerable period after complete formation of the skull. Between these sutures is a ligament of an elastic nature, thus preventing the interposition of blows or jars received upon the skull.

The Hyoid or Lingual Bone supports the tongue and gives attachment to its numerous muscles. It is a bony arch, shaped like a horseshoe.

The Thorax or Chest is a bony cartilaginous cage, intended to contain and protect the principal organs of respiration and circulation. It is conical in shape and consists of the *sternum* in front, a part of the spine behind, and the ribs on either side.

Sternum or Breast Bone is a flat and narrow one, situated in the median line of the chest, and consists, in an

adult, of three undivided portions; the upper part is called the *manubrium*, the middle section the *gladiolus*, and the lower attachment is known as the *ensiform*.

The Ribs are elastic arches of bone which form the chief part of the thoracic walls. They are twelve in number on each side. The first seven are connected behind with the spine, and in front with the sternum, through the intervention of the costal or rib cartilages. These are called *true ribs*. The remaining five pairs are *false ribs;* of these the first three are connected behind with the spine, and in front with the rib cartilages. The other two pairs are connected with the spine only, being free at the other ends. They are also called *floating ribs*.

During mediæval times, when knowledge as to human anatomy was only in the possession of a few, the belief doubtless originated, and has in many instances been transferred to the present generation, that woman, the blessed helpmate of man, was the possessor of one more rib than the male. This erroneous idea was doubtless formed through Biblical lore, so beautifully described in the history of creation.

The extremities, or limbs, are those long jointed appendages, which are connected to the trunk at one end and free in the rest of their extent.

THE UPPER EXTREMITY.

Consists of the arm, fore arm and hand. Its continuity is established with the trunk by means of the shoulder, which does like service for the upper extremity, as the haunch bone in the lower limb.

The Clavicle or Collar Bone forms the front portion of the shoulder girdle. It is joined on one side to the sternum or breast bone, while on the other it articulates with the shoulder blade. It represents a double curvature, somewhat resembling the Roman letter "f."

The Scapula or Shoulder Blade forms the back

part of the shoulder. It is a large flat bone, triangular in shape.

The Humerus or Arm Bone is the longest and largest bone in the upper extremity. It articulates with the shoulder blade at the upper part, and with the two bones of the fore arm at the lower end.

The Forearm, or that portion between the elbow and wrist, has two bones. The *ulna*, so called from its forming the elbow, is a long bone placed at the inner side of the fore arm and runs parallel with the *radius*, the other bone. Its name implies "a spoke," and acts as a brace to the ulna, on the outside of which it is situated. The radius is not quite as long and thick as the ulna.

The Hand. The skeleton of this useful member is subdivided into three segments:

1. *The Carpus or wrist bones*, eight in number, are arranged in two rows, and are named scaphoid, semilunar, cuneiform, pisiform (forming the upper row). Those of the lower are the trapezium, trapezoid, os magnum and unciform.

2. *The Metacarpus, or bones of the palm*, are five in number, corresponding to the number of fingers and thumb in each hand.

3. *The Phalanges or bones of the fingers*, are fourteen in number in each hand, three for each finger and two in thumb.

THE LOWER EXTREMITY.

Consists of three segments, the thigh, leg and foot, and corresponding to the arm, forearm and hand in the upper extremity. It is connected to the trunk through the hip bone.

The Innominate or Nameless Bone, so called, from bearing no resemblance to any known object, is a large irregular shaped bone, which, with its counterpart on opposite side, forms the front and side walls of the pelvic cavity. In young people it consists of three sepa-

rate parts, which meet and grow together, as the little body develops, and forms a basin-like cavity. Notwithstanding the fact that they are firmly united in the adult, it is usual to describe this bone as divisible into three portions, namely: The *ilium*, the *ischium*, and the *pubes*. The ilium is the flank bone, the crest of which can be felt inside. The ischium is the hip part, and the pubes is the front portion of the pelvis, supporting the external organs of generation.

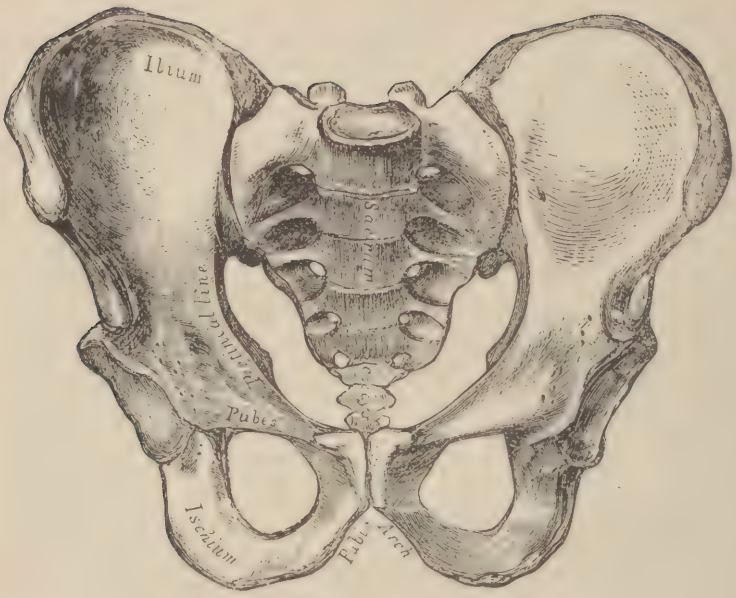
The Pelvis, named after its resemblance to a basin, of which the word is a Latin translation, is the strongest constructed cavity in the body. It is composed of four bones, viz.: The two innominate bones, the sacrum and the coccyx.

The difference in the male and female pelvis, that is to say in adults, is very marked, and best comprehended by studying the engravings upon the subject. These drawings were made from normal and average persons, and from them can be plainly seen the larger inlet and outlet of the female pelvis. At birth the fœtus passes through this opening, hence this wise and providential provision.

The Femur or Thigh Bone is the longest, largest and strongest bone in the skeleton, and measures about one-fourth of the whole length of the body. It is interesting surely that the very common ball and socket movement, so extensively applied nowadays in mechanics, was patterned after this joint, inasmuch as the head of the femur, forming a ball, and it being inserted into the socket of the innominate bone, forms the articulations of the upper thigh. Faith in common sense prohibits, at this instance, to speak of the intricate and numerous movements which can be accomplished thereby.

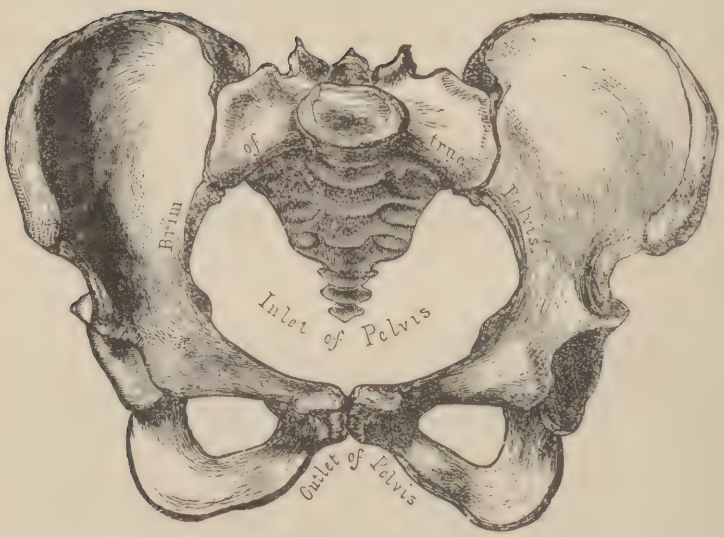
At the lower end it is considerably expanded forming the upper part of the knee joint, and articulates there with the knee pan and tibia.

The Patella, meaning literally "a small pan" is a flat,



Engraving No. 5.

Male Pelvis, (Adult).



Engraving No. 6.

Female Pelvis, (Adult).

somewhat triangular shaped bone at the front part of the knee joint. In youths this bone is more of a cartilaginous formation and completes its process of ossification about the age of puberty. It articulates with the femur.

The Tibia or Shin Bone is situated at the front and inner part of the leg. At the inner front part this bone has no further protection than the skin, in consequence the frequent and painful injuries to the shins. It articulates with the femur, fibula and astralagus.

The Fibula is situated at the outer side of the leg and acts as a brace to the former. It articulates with the tibia and astralagus.

The Foot consists of three different sets of bones.

1. *The Tarsus Bones*, seven in number, and are named the os calcis, astralagus, cuboid, scaphoid, internal, external and middle cuneiform bones. This class of bones form the ankle and do like service for the foot, as the wrist bones do for the hand.

The Metatarsal Bones are five in number, corresponding with the toes in that respect. Each one of these bones articulates at one extremity with the first row of tarsal bones, and at the other with the phalanges.

The Phalanges of the foot, both in general arrangement and number, resemble those of the hand. Like the thumb, the great toe has two, while the others have three phalanges.

Dear reader, did you ever concentrate your mind upon this wonderful framework described in preceding pages? In it, we can see the many, many examples of skill and wisdom of the Architect of the Universe. Take the skeleton as a whole, and we have before us the fundamental principles of a faultless piece of mechanism in which every part, may it be ever so small, illustrates some profound scientific doctrine. As a whole it is perfection, but let one part become diseased or destroyed, the aggregation

becomes impaired. Hence the necessity of keeping this part of our anatomy in order, we must live in accordance with the well defined laws of health. Under these may be enumerated the partaking of proper food, which is necessary to replace the worn out bone tissues. We must perform such labor or exercise as will keep up the elasticity, nor must we overdo the same to such extent as will injure any part of our bony structure.

CHAPTER II.

THE ARTICULATIONS.

The various bones of which the skeleton consists are connected together at different parts of their surface, and such connection is known as a *joint* or *articulation.*

In *joints*, as in the skull, their adjacent margins are applied in almost close contact, a thin layer of fibrous membrane, the *sutural ligament* being interposed. Where slight movement is required, combined with great strength, the bony surfaces are united by tough and elastic cartilages, as in the joints of the spine; but in the movable joints, the bones forming the articulation are generally expanded for greater convenience of mutual connection, covered by cartilage, held together by strong ligaments and partially lined by a membrane, which secretes a fluid called *Synovia*, to lubricate the various parts of which the synovial membrane is formed.

The different structures which enter into the formation of a joint are bone, cartilage, ligaments and synovial membrane.

Bone constitutes the fundamental elements of all joints.

Cartilage covers the articular surfaces of bone.

Ligaments are found in nearly all the movable articulations, and consist of bands of various forms, serving to connect together the articular extremities of bones. Ligaments are pliant and flexible so as to allow of the most perfect freedom of movement. They are strong,

tough and inextensile, and do not yield under severely applied force.

Synovial Membrane is a thin, delicate membrane, of a dense and smooth structure, and surrounds synovial capsules and other synovial cavities. This membrane secretes:

Synovia, a transparent, viscid fluid serving to lubricate the joints. It resembles in appearance the white of an egg. Synovia is more commonly known as joint water.

Immovable Articulations includes all those in which the surfaces of the bones are in almost direct contact, and in which there is no appreciable motion. To this class belong the interlocking seams or sutures in skull and other joints therein, except the lower jaw.

Mixed Articulations are those connected by cartilages, not separated by synovial membrane and having limited motion. The joints between the bones of the vertebræ belong to this group.

Movable Articulations includes by far the greatest number of joints in the body, mobility being their distinguishing character, and are subdivided into different classes.

1. *Gliding Joint*, as in the articulation of the collar and breast bones.

2. *Ball and Socket Joint* allows motions in all directions. To these belong hip and shoulder joints.

3. *Hinge Joints;* in these, motion is limited in two directions, forward and backward. Elbow, ankle and knee perform hinge joint movements.

4. *Pivot Joint* is articulation by a pivot process, turning within a ring around a pivot. As in the articulation of the atlas upon the axis, and radius upon the ulna.

5. *Condyloid*, as in the movements of the wrist joint.

6. *Reciprocal reception* are those where articular surfaces inversely convex in one direction and concave in the other. Movements in every direction, except axial rota-

tion. Best explained by the movement of the second joint of the thumb.

The kinds of movements admissible in joints are usually divided into four classes :

1. *Gliding movement* is the most simple kind of motion that can take place in a joint. It is common to all movable joints, and the only movements permitted in the wrist and ankle.

2. *Angular movement* only occurs between long bones. It may take place in four directions: Forward, backward, inward and outward.

3. *Circumduction* is that limited degree of motion which takes place between the head of a bone and its articular cavity, and is best seen in the shoulder and hip joints.

4. *Rotation* is the movement of a bone upon its own axis, as in the movement of the head upon the neck.

Joints perform certain functions as above described, but this is not all, for they enable the body to sustain greater weight and owing to their flexibility they diminish the force of blows and shocks. In their freedom of movement, they modify the direction in the action of muscular power. In our daily avocations, the joints are in constant action and wear out to some extent, like machinery. Hence, the difficult movements in persons in advanced age, and having behind them a record of great activity or the reverse.

CHAPTER III.

THE SKIN

And Its Appendages.

The skin is the principal seat of touch, and serves as a covering for the protection of the deeper tissues. It is also of much importance as an organ of excretion and absorption. It consists principally of layers, which are nicely seen in the engraving, which shows a highly magnified section of same, together with notes, as to the different layers, and is self explanatory and a graphic object lesson, on this very important organ.

The skin is divided into two principal layers, which can be readily separated; these are the *derma* or *true skin* and *cutis* or *scarf skin.* The true skin is attached more or less closely to the tissues beneath it, in the meshes of which fatty deposits are formed. These fatty tissues are found beneath nearly all the skin, except under eyelids and external portions of the ear, and varies from 1-12 to 1-2 inch in thickness in different parts of the body. In the human being, upon the head and neck small muscles are attached closely to the skin, which allow to some extent the moving of the skin, as for instance the wrinkling of the forehead. Distributed throughout the true skin are numerous elastic fibers and nonstriated muscular fibers which are held firmly together. These small muscular fibers are very abundant about the hair follicles and sebaceous glands connected with them, and their arrange-

ment is such, that when they are excited through cold or electricity they contract, the follicles are drawn up, projecting upon the general surface, and produce the appearance known as "*goose skin.*"



Engraving No. 7.
Sectional View of the Skin. Magnified 30 times.

1. Epidermis or Cuticle.
2. Derm or Cutis.
3. Subcutaneous Cellular Tissue.
4. Rete Mucosum.
5. Superficial Layer.
6. Hairs.
7. Hair Follicle.
8. Hair Bulb.
9. Sebaceous Glands.
10. Sweat Glands.
11. Sweat Ducts.
12. Sweat Pores.
13. Fat Cells.
14. Fibrous Tissue.
15. Nutrient Artery.

The true skin is abundantly supplied with blood-vessels, terminating in looped capillary plexuses and with

nerves. The termination of these nerves, in the true skin is somewhat obscure; even the greatest of researchers in the broad field of physiology differ in their opinions. However, the theory of Professor Kölliker, a noted German histologist, promulgates one, which seems to some extent within the limits of human reason. He claims "that in the immense majority of instances, the sensitive nerves terminate in some way in the hair follicles." That this is a fact to some extent, can be demonstrated by touching the hair in the nose or ear of a sleeping person, either with a feather or straw, and unless the party is entirely void of sensitiveness, you will shortly see how his nerves are aroused.

The greatest of American physiologists, Professor Austin Flint, Jr. of New York, does not entirely agree with this theory, but asserts positively: "That nerve fibers form a network in the deeper tissues of the skin, throwing from it, branches to the hair follicles and to the muscular fibers of the skin, where they are lost."

Unquestionably, both these learned men are right in their theories, for we know that when we touch a hair, or a part of the skin where no hirsute appendage is located, we perceive the act.

The *Epidermis* or external layer of the skin, is a membrane composed exclusively of cells, containing neither bloodvessels, nerves or absorbing vessels. Its external surface is marked by exceedingly shallow grooves, which correspond to the deep furrows between the nipple-like projections (papillæ) of the true skin. This portion is subdivided into two tolerably well defined layers. The internal layer is called the rete mucosum, while the external one is termed the horny one. The internal layer or rete mucosum, is composed of a single stratum of prismoidal, nucleated cells, containing a certain amount of pigmentary matter.

The last sentence, when read, will doubtless be consid-

ered in another than an instructive light. But the dry technical phrases are necessary in the explanation why the negro is black, or nearly so, why an Indian has the hue of a copper teakettle, which has had no scouring in a fortnight, and why our cannibal brethren in the islands of the Pacific Ocean have a brown color. In fact, why different races have different colors.

These colors are chiefly due to these pigmentary layers, which gives the skin these characteristics, as well as the peculiarity in the complexion of different races and different individuals.

In the negro this layer is nearly black, but when the epidermis is removed the true skin shows no marked difference from that of a white man.

The cells of the pigmentary layer are from $\frac{1}{400}$ to $\frac{1}{200}$ of an inch in length, and from $\frac{1}{300}$ to $\frac{1}{400}$ of an inch in their short diameter. The thickness of the rete mucosum varies from $\frac{1}{1700}$ to $\frac{1}{75}$ of an inch.

The horny layer is composed of numerous strata of hard flattened cells, irregularly polygonal in shape.

The epidermis serves to protect the more delicate structure of the true skin and its thickness is proportionate to the exposure of the different parts. We find therefore that it is much thicker upon the soles of the feet and palms of the hands, than in other portions of the body less exposed. The thickness in the instances mentioned is much increased in those who habitually go barefooted, and those who are constantly engaged in manual labor.

The Nails are flattened horny structures, placed upon the dorsal surface of the last phalanges of the fingers and toes. In the normal state a nail is accurately moulded upon the cutis as the epidermis is on other parts. It is implanted by its root into a groove in the skin, and exposing the body and free edge. For a closer and more vivid description of the nails, the reader is respectfully invited to investigate his own, and embrace the opportunity to remove the surplus of the free edge.

Their purpose is doubtless that of protection to the termination of the extremities. They may also be classed among the weapons nature has kindly provided.

The Hairs are an appendage to the skin in the shape of a very peculiar modification of the epidermis, which they resemble as to the component parts. Hairs are found on nearly every part of the body, the soles of the feet and palms of the hands excepted. They vary very much in length, thickness and color in different parts of the body, as well as in different races of mankind. Microscopical investigation reveals that they present a cylindrical, or more or less flattened form.

The hairs on a human body are usually divided into three varieties.

1. *Long* or *Soft* hairs, are those of the head and face of the male adult, around the genital organs, and under the armpits. In some males they are also found upon the breast.

2. *Short* or *Stiff* hairs are found at the entrance of the nostrils, upon the edges of the eyelids and eyebrows.

3. *Short, soft, downy* hairs are those on the balance of the surface of the body, where the other varieties are absent.

Hairs in their normal condition are very elastic, and may be stretched considerably. They are also a very strong "fabric," which depends, however, upon its thickness. An ordinary hair from the head will bear a weight of from six to eight ounces.

Through friction, hair generates a considerable amount of electricity, which is specially the case in cold and dry weather. This interesting phenomenon can be nicely demonstrated by taking a full grown cat upon your lap, in a room where the air is dry and cool, and by stroking the hair of your pet along the back, commencing at the tail and moving toward the head. The light must of course be extinguished, and you will soon feel a gentle electric

current through your hand, and see the electric sparks spurt from your hairy pet.

The *roots* of hair are embedded in follicular openings of the skin, differing in the different varieties of hair in the depth to which they penetrate. The downy hairs do not go very deep, but the thick ones penetrate beyond the true skin, and their roots are found in the adipose tissue.

The root is considerably softer than the projecting part, and is a round bulb.

The *Follicles* form tubular sheaths in which the hair is inclosed and is a part of the skin. Connected with the follicles are minute bundles of involuntary muscles, which when they contract through any cause, make the hair stand in an erect position, or nearly so.

The *Sebaceous Glands* are small, sacculated organs, lodged in the substance of the skin; they are found in almost all parts of the dermis. Their purpose is the secretion of a fatty substance, which finds egress through the hair follicles. It is through this fatty secretion that the hair retains its natural gloss and smoothness.

Blanching of the hair occurs occasionally, from fright and grief, and in remarkably short spaces of time. The cause is evidently due to intense mental emotion, but the mechanism of this change is not understood. We refrain from mentioning the many theories upon this subject, because they are not borne out by facts.

Uses of the Hair. Hair serves an important purpose in the protection of the general surface, and in guarding certain orifices of the body. The hair upon the head protects it from the rays of the sun as well as cold. While the hair upon the body outside of scalp and beard, is not of great amount, it is a very imperfect conductor of heat, and serves to a certain degree to maintain the warmth of the body. Furthermore, these downy little growths moderate friction upon the surface. The eyebrows turns the perspiration out of its course, and prevent

that saline matter entering the eye. How painful it is when we catch a cinder in our eye, nearly everybody has experienced, but few, we predict, have thought of the wisdom of the Creator, in preventing this very disagreeable sensation by giving us eyelashes. Beards are an adornment, and it is only through the command of fashion, or the inclination of an individual, that it should be removed through the process of shaving. With the removal of these hairs, we open to our lungs the free access of dust and soot, we rob through the cutting off of the chin beard the natural protection for the vocal organs, and by shaving on the cheeks, we offer a premium on face and toothache.

The hair in nose and ears serves similar purposes, namely, the prevention of the entrance of dirt and cold air.

The prevailing idea that long hair denotes strength is an erroneous one, for the simple reason that the nutrients which caused this growth were deviated from their proper channel, to the detriment of other parts. One will almost always find beautiful tresses in consumptive ladies.

In this connection we desire to add our condemnation of the indiscriminate use of the many advertised hair tonics and dyes; that they are detrimental, every user of them is aware, but the persistency with which they are held on to, shows little knowledge of the laws of nature. Of course there are certain medicaments which will be described hereafter, that are free from any deleterious substances, but even these should only be resorted to when the symptoms warrant it.

Perspiration embraces the entire functions of the skin as an organ of excretion of both the watery vapors and organic matter and carbonic acid. It is from the latter that bedchambers become so excessively charged, when people close up every hole in their apartment, and thus shut off ventilation entirely. As an eliminator of impurities which the body desires to cast off, the skin performs a very important office. Comparatively speaking, how-

ever, the quantity eliminated by the skin, compared to that cast off by the lungs in the form of carbonic acid, and by the kidneys in the shape of urea dissolved in water, is very small. That this eliminating organ is of the utmost importance, is simply shown by the fact that if a body is covered entirely by an impermeable coating, such as is often resorted to by lawless persons in the application of "tar and feathers," death will soon result from the depression of animal heat of the body incident thereto.

Sweat Glands and Ducts. The secretory organs in perspiration, are the sweat glands. Like other glands they serve to withdraw from the blood substances both superfluous and at the same time necessary for its existence. These glands are found in nearly all parts of the body. They consist of simple tubes perforating the skin, which are the ducts, while beneath the cutis these tubes form in a convoluted coil, rounded or ovoid in shape. The length of the ducts varies with the thickness of the skin. The little glandular coils vary in size from $\frac{1}{125}$ to $\frac{1}{25}$ part of an inch, the largest being found under the skin of the armpit. These minute glandular bodies are surrounded by a network of capillary bloodvessels, the contents of which furnishes the excretory mass.

The number of these sweat glands in the body is somewhat astonishing, but varies as to different parts of the surface. Prof. Krause of Germany, has found great differences in the number of perspiratory openings in different portions of the skin, and estimates the number in a square inch in certain parts, as follows:

To the square inch on:

Forehead	1,258
Cheeks	548
Neck	1,303
Breast	1,136
Abdomen	1,136
Back	417
Arm	1,114

Palm	2,736
Back of Hand	1,490
Thigh	566
Sole of Foot	2,685
Back of Foot	924

From these figures the learned man before mentioned, estimates that the entire number of glands of this kind in the whole body is 2,381,248. If a single coil is unraveled, it would measure about $\frac{1}{16}$ of an inch; the entire length of the secreting tubes is about 2½ miles; this distance does not include the length of the excretory ducts, or pores of the skin.

The influence under which the nervous system holds these sweat glands is somewhat remarkable, and best explained by drawing the attention of the reader to himself. No doubt he has been scared, or undergone a mental emotion to greater or lesser extent, and while under this spell, has perceived the cold perspiration upon his brow. We say "cold" designedly, for the body was cooled through the eliminated moisture, hence, the cold perception, and not from the temperature of the sweat.

In very warm weather perspiration is a great relief, for the reason that moisture applied to the body from its own fountain, cools the surface and makes oppressive heat bearable.

Quantity of Sweat eliminated is subject to great variation, and dependent upon conditions of temperature and moisture, exercise, and the quantity and quality of food one partakes. Professor Seguin made as late as 1790, after the most exhaustive researches, the estimate that at an average an adult human body is relieved every twenty-four hours of about one pound and fourteen ounces of sweat. This estimate has been verified since then by other eminent scientists as a correct one.

Through systematic, violent and prolonged exercise, the body eliminates abnormal quantities of sweat, and it is

for this reason that amateur or professional athletes resort to a course of training by which their weight can be reduced, and be relieved of superfluous adipose tissue.

The exposure of the body to a very high temperature has similar effects, as is evidenced by the Turkish or Russian baths. Through the cleansing process the pores are opened, and through the heat the moisture in the body is expanded, and readily eliminated by the open pores.

Composition of Sweat. Many different ingredients are held in suspense in this fluid, and by submitting a correct analysis the reader will perceive how it is that he does not urinate quite so voluminously when in a free state of perspiration. The composition is about as follows :

Water	995·573
Urea (same as in urine)	.043
Alkaline	.331
Chlorides (soluble in water)	3·792
Alkalines " " "	.261
	1,000.000

Certain peculiarities in regard to the odor of sweat are quite marked, as for instance under the armpits, the feet, and around the genitals. That this rather disagreeable smell exists in some persons is not entirely due to the laxity in bathing, for it is in the nature of the eliminated matter which holds some volatile substances, which cause this malodor peculiar to the afflicted individual. The frequent ablutions will ameliorate this trouble, but not effect a cure.

Surely this chapter on skin would not be complete unless closed with the old adage, "Cleanliness is next to Godliness."

CHAPTER IV.

THE MUSCLES.

The muscles in the human body are organs, which by their contraction produce motion. They are made up largely of contractile tissue.

There are two kinds of muscles:

1. The *striated* or *voluntary* muscles, which constitute the principal part of the flesh, or the so-called lean meat, exclusive of the fat. This class are under the control of the will, and are made up of great numbers of elongated fibers bound together into bundles and inclosed in a sheath of connective tissue. Each fiber is also inclosed in a delicate membrane called the *sarcolemma*.

2. The *non-striated* are *involuntary* muscles. They constitute a large part of the walls of the intestines and stomach (muscular coat) bloodvessels, uterus, bladder, iris, hair muscles, and the largest and most important is, of course, the heart. The diaphragm or midriff also belongs to this class. These involuntary muscles are made up of greatly elongated cells, usually grouped in bundles or sheets.

The muscles vary extremely in their form, but no less in size. One muscle, the *Gastrocnemius*, forms the chief bulk of the back of the leg. The fibers of the *sartorius* or tailor's muscle measure nearly two feet in length, whilst the stirrup muscle or *stapedius* of the internal ear weighs only one grain, and its fibers are only one-sixth of an inch in length.

We desire to draw attention to the fact that in well nourished persons the bony projections of their framework of bones are represented by depressions instead of projections. The reason for this is, that the bulk of the neighboring muscles, which usually arise by small tendons form such bony prominences, the tendons giving quickly place to large muscular bellies. In very thin persons this rule is reversed and the prominences of the skeleton are shown. In long sicknesses, where muscles and fat are wasted, the bony projections become apparent again and lead to bedsores.

The names of the different muscles have been derived from their situation, from their uses, from their shape, from their number of divisions, and from their points of attachment.

The Fasciæ or Sheaths are membranes of a dense, inelastic, unyielding nature, forming sheaths for the muscles and affording them broad surfaces for their attachment.

The muscles are usually arranged according to the general division of the body, cranium, face, neck, trunk, upper and lower extremities.

MUSCLES OF THE FACE AND CRANIUM.

Those of the *face* and *cranium* are thirty-three in number on each side of the head, which with the *occipito-frontalis* or musculo-fibrous layer, covering the cranium from the hind part of the head to the eyebrows, makes sixty-seven muscles in all in this part of the body.

It would not be of interest to the general reader, to give a minute description of each and every muscle in this region, but hope it will not be amiss to draw attention to some of those which we can follow and observe in their action on our living fellow beings. The location of the occipito-frontalis has been mentioned above; it forms a cushion for the crown of the head, its elastic nature often

prevents the contusion of the skull, and owing to its movability it is of much use to baldheads, to disturb the flies which so often perch on this erroneous sign of frontal eminence. The frontal portion of this muscle raises the eyebrows and draws the scalp forward through which the forehead is thrown into transverse wrinkles. The habitual raising of eyebrows by persons having great movability of this muscle causes permanent wrinkles and many a person hates for this reason the mirror, because it discloses lines, which fashion stamps as derogatory to beauty.

It is also instrumental in giving the expression to the face in case of surprise. Each eyeball is supplied with four small muscles called the *recti*, one each superior, inferior, external and internal. These muscles give free motion in the sockets, aided by the oblique muscles of the eyes. Thus we are allowed to raise our eyes in adoration and to cast them down in shame or to look sidewise for a foe.

The muscle which performs important functions in the nasal organ, was called by the anatomist who first drew attention to it, the *Levator labii superioris alæque nasi*, surely more name than muscle. The plain English of this Latin line means that this muscle will raise the upper lip and dilate the nostrils, or "lifter of the upper lip and wing of the nose." The action of this muscle produces a marked influence upon the countenance, and is the principal agent in the expression of indignation and disgust.

The Orbicularis Oris, or the muscle surrounding the mouth, in its direct action closes the mouth, which, when done by persons without incisors, causes the lips to wrinkle. Firmness of character is often expressed through this muscle.

The *Buccinator or Trumpet Muscle* occupies the interval between the jaws at the side of the face. It contracts and depresses the cheeks, so that during the process

of mastication the food is kept under the immediate pressure of the teeth. Its name is derived from the Latin word "buccina," or trumpet, for when the cheeks have been previously extended by air this muscle expels it from between the lips, as in blowing a horn.

MUSCLES OF THE NECK.

The *muscles* of the *neck* are quite numerous and closely knitted. They are sixty-three in all. Among this important group is the *tongue*, the organ so necessary in the many avocations the body performs.

MUSCLES OF THE TRUNK.

The *muscles* of the *back* are very numerous, sixty-four in number, one-half on each side of the spinal column.

The *muscles* of the *abdomen* are six on each side of a vertical line through the umbilicus or navel. This line is also called the *white line* or *linea alba*. This set of muscles performs different actions, namely, when they constrict the abdominal cavity, in which act they are also materially assisted by the diaphragm, the fæces from the rectum and the urine from the bladder are evacuated. The contents of the stomach are also expelled through the process of vomiting by their action.

The *muscles* of the *breast* are only five in number, and form mostly the flesh between the ribs and under the breast bone.

The muscles between the ribs, also called *intercostal muscles*, are the main agents in ordinary respiration.

Assisting in this function is also the *Diaphragm*, which signifies a partition wall. It is a thin musculo-fibrous division or septum between the abdominal and thoracic cavities. This partition wall or diaphragm descends during inspiration and ascends during expiration.

THE MUSCLES OF THE UPPER EXTREMITY.

These are ninety-two in number, one-half on each side. This group includes all the muscles of the shoulder and form attachment to the chest, arm, forearm and hand.

Doubtless every one of our readers has heard about flexors and extensors, when the subject of conversation is upon muscles, and as they appear only in the extremities, it is believed to be appropriate to explain the meaning of these technical phrases. When you bend your arm at the elbow or wrist it is the action of the different flexors, and when you straighten the member, the extensors perform their duty. The same occurs when the fist is clenched or the palm open.

The *Pectoral* or breast muscles are the fleshy part which extend from the arm pits over a large portion of the chest. They are two in number on each side, the small and the large, the former underlying the latter. These are of much assistance in forced respiration owing to the fact that they are connected by their fibers to the lower portion of the breast bone. Thence by the contraction of these muscles, powerful assistance is given in elevating and expanding the chest, thus giving an opportunity for the lungs to inflate themselves with air, which is the act primarily sought in respiration.

The *Deltoid*, named from its resemblance to the Greek letter delta, forms the rounded eminence of the shoulder and arm. It raises the arm directly from the side, so as to bring it at right angles with the trunk; assisted by the pectoral muscle it draws the arm forward as in the act of reaching for an object which is at a height equal to that of your shoulder

The *Biceps* muscle is found at the middle of the arm and named so, because it has two heads at its insertion; this is the muscle which bulges out when the arm is bent and the fist is clenched, and is a part of the anatomy

in which young and athletic men have much pride, if well developed, through healthful and judicious exercise or labor.

THE MUSCLES OF THE LOWER EXTREMITY.

In each extremity are fifty-one muscles, or 102 in all, hence the greatest number in any one group.

In the arrangement and action of the muscles and joints of the lower extremity compared with that of the upper, a striking difference becomes apparent. The main function of the arm is that of prehension, all the flexors are placed anteriorly, and the flexion of all its joints is in the same direction. This order of things is different in the leg; it being for locomotion and station, the arrangement of the flexors is one of alteration. Thus the flexors of the hip joint are in front, while those of the knee are behind; those of the ankle in front; those of the toes posteriorly. The joints, of course, are conformable to this arrangement. Had the wise Designer of the human body been otherwise in his arrangement the polite bow or a stoop would be impossible, nor could the fervent prayer be offered in the prevailing position of kneeling. Outside of this an erect stationary position would at least be uncertain, and would need support.

Among this group, muscles of unusual interest are found, and in describing a few of them, by going from the hip down, the first attracting attention are the *psoas muscles*, or muscles of the loin. In the human subject there are two of these on each side of the vertebra, one large and one small. They are on the internal portion and cannot be felt by touching the outer part. For this deficiency in satisfying one's inquisitiveness, these loin muscles make up, when they show their location when a person is afflicted with lumbago, which is a rheumatism of a neuralgic character in these parts. The purpose of these two pairs of muscles, besides aiding in movements of the body,

is to maintain the erect position of it by supporting the spine and pelvis upon the femur, and to assist in raising the trunk when the body is in a recumbent position.

In comparative anatomy, for instance, in that of the ox or hog, these parts would be spoken of as beef or pork tenderloin.

The next set of muscles in this group which need a few words of description is the *Glutæus*, of which there are three in each thigh.

The *Glutæus maximus* is the most superficial one, and is a very thick, fleshy mass, in stout persons somewhat overhanging the thigh, and forms the prominence of the nates or buttocks.

The *Glutæus medius* and *minimus* are the other two pertaining to this set. Owing to their voluminousness they are great supporters of the hip joints and partake in numerous movements of the lower extremities.

The *Biceps* of the thigh is located in the posterior part and is usually called the hamstring muscle. It is large and of considerable length, and causes the leg to flex upon the thigh.

Another muscle of much interest is the *Sartorius*, the longest muscle in the body. Its name is derived from the word "Sartor" a tailor, because that industrious tradesman assumes a distinct position when seated upon his workbench, in which this muscle takes that part which permits the folding of the legs. In an average person one of these muscles measures about two feet.

Besides the above, the *rectus*, *vasti* and *leg* muscle. form the chief bulk of the thigh, between the nates and the knee.

The muscles below the knee are also quite numerous, and perform many functions, which we can better learn from observation on ourselves, than by a description.

The reader's attention is however invited to study carefully the plate which so graphically explains the situ-



Engraving No. 8.
The Muscular System.

THE MUSCULAR SYSTEM.

(Engraving No. 8.)

Names of Muscles and Their Action.

1. *Occipito-Frontalis.*—Used to raise the eyebrows, wrinkle the skin of the forehead, and move the scalp backward and forward.

2. *Orbicularis Palpebrarum.*—Closes the eyelids.

3. *Temporalis.*—Helps to elevate the lower jaw.

4. *Sterno-cleido-mastoideus.*—A pair of muscles which together bow the head forward; one acting by itself is able to turn the head, and therefore the chin to the other side.

5. *Masseter.*—Helps to elevate the lower jaw, and move it forward.

6. *Platysma myoides.*—Assists in depressing the angle of the mouth.

7. *Trapezius.*—When acting together draw the head directly backward; one of them acting alone, inclines the head to the corresponding side; the superior part of the trapezius raises the point of the shoulder.

8. *Deltoides.*—Raises the arm, and aids it in carrying it forward and backward.

9. *Biceps.*—Act in bending the forearm.

10. *Brachialis anticus.*—Same action as last.

11. *Supinator longus.*—A flexor of the forearm.

12. *Triceps extensor cubiti.*—Antagonistic of Nos. 9 and 10; when the forearm is bent, the triceps, by drawing in the extremity of the ulna, is able to extend it on the humerus, and thus bring both parts of the limb into a right line.

13. *Extensor.*—Muscles of wrist.

14. *Extensor*—Muscles of thumb.

15. *Pectoralis major.*—Conjointly with No. 17, these muscles lower the arm when it has been elevated, press the arm closely to the side. It will also alone carry the arm along the side and front of the chest.

16. *Serratus magnus.*—Assists in advancing the shoulder blade and elevating the shoulder.

17. *Latissimus dorsi.*—See 15.

18. *Obliquus externus abdominis.* } Abdominal muscles supporting
19. *Rectus abdominis.* } the abdominal viscera.

20. *Tensor vaginæ femoris.*—Renders the fascia tense and turns the limb inward.

21. *Glutæus medius.* } These muscles act alternately on the
22. *Glutæus maximus.* } thigh bone and pelvis; the Glutæus medius, by the direction of its fibers, is fitted to draw the thigh bone backward while it turns the whole limb outward if it be kept extended.

23. *Biceps flexor cruris.*—Assists in bending the leg on the thigh and in turning the limb slightly inward and outward.

24. *Vastus externus.*—Contributes to extend the leg upon the thigh.

25. *Tibialis anticus.*—Coöperates with 32 in bending the foot on the leg; acting separately, each gives a slight inclination toward the corresponding side.

26. *Gastrocnemius.*—Along with the soleus (27), this muscle forms the calf of the leg; they jointly draw on the heel bone, lifting it from the ground, and cause the foot to represent an inclined plane.

27. *Soleus.*—See 26.

28. *Extensor longus digitorum.*—Aids in extending the toes, and in bending the foot upon the leg.

29. *Peronæus brevis.* } Act together in drawing the foot
30. *Peronæus longus.* } back.

31. *Abductor minimi digiti.*—Bends the little toe and separates it from the others.

32. *Peronæus tertius.*—A flexor of the foot on the leg coöperating with 25.

33. *Extensor proprius pollicis.*—Extensor of the great toe.

34. *Tendon Achillis.*—Formed by junction of tendinous expansions of 25 and 26, and is the strongest tendon in the body.

35. *Flexor longus digitorum.*—Bends the toes toward the soles of the foot.

36. *Sartorius.*—Bends the leg upon the thigh; it is the longest muscle of the body, and is also known as the "tailor's" muscle.

37. *Insertion of ligamentum patellæ* in tibia.

38. *Vastus internus.*—Extends the leg upon the thigh.

ation of the numerous muscles of the human body, and learn from it the wonderful movements a person is capable of, and how they are performed by the muscles, as servants of the mind.

Tendons. The muscles of the body, except in case where their point of attachment is upon a broad surface, as the muscles between the ribs, come to a point, and the fibers form into tendons of a white, glistening, fibrous nature. These tendons, oftener spoken of, as cords or sinews, make attachment to the periosteum or ligaments, and thus connecting with the bony framework of the body, completing thereby in that wonderful chemico-mechanical machine—*the human body*—the numerous object lessons as demonstrated in the mechanical arts, by hinges, pulleys, rotary apparatus, slides, and in fact any and all contrivances, requisite in movement and locomotion. The great throttle valve for all this machinery is invisible, but we are cognizant of its existence. *It is the will power.*

Muscles possess certain general properties which are not shared in by the other tissues of the body. They are:

1. *Elasticity.* The true muscular substance, as described in the beginning of this chapter, does not partake so much of this, but it is the *sarcolemma* or sheath inclosing the muscle corpuscles, which contributes so much to this property. Through fatigue the extensibility of the elastic portion of the muscles is increased, which phenomenon is evidenced by the fact, that after extraordinary muscular exercise, the muscles are relaxed. This constitutes fatigue of body, but as soon as new nutriment is given, during a period of rest, their contractility is re-established, and with it the property of elasticity.

2. *Tonicity.* Under this expression is meant, that the muscles, under normal conditions, have an insensible and constant tendency to contract, dependent more or less

upon the action of the motor nerves. The cause of this property can be expressed in one word "*phenomenal.*"

3. *Sensibility.* Through this property of the muscles, which they possess to such an eminent degree, we are enabled to appreciate the power of resistance, immobility, and elasticity of substances, that are grasped, or on which we tread, or which, owing to their weight, cannot be influenced through the exertion of muscular power. In regulating the amount of force required for the accomplishment of muscular acts, we are enabled to do so by the appreciation of the weight and resistance. Often, after long continued muscular efforts, when fatigue of the muscles interferes in the continuance, the nervous force still urges the muscles on; they obey, but the time also arrives when the nerves become also fatigued, and when these two elements of the body are worn out, exhaustion of body and mind ensues.

Muscles are often thrown into spasms or contractions, as in the cramps of cholera, lockjaw, or strychnine poisoning and become very marked. In the beginning of these symptoms, the mind remains unclouded, by which the pain is increased.

4. *Irritability* or *contractility.* Under these terms is understood, that the muscles are able to perform certain peculiar and characteristic functions, if urged by a proper stimulus. Or in other words, when an idea originates in our brain, which involves movement of the body, the nerves receive an impression and carry it to the muscles, which are required to participate in the movement. The muscle or muscles contract and in doing so, the first step in movement is accomplished. As long as life lasts, provided the body is still in a normal condition, the muscles will always contract in obedience to a proper stimulus applied either directly or through the nerves.

CHAPTER V.

THE BLOOD AND ITS VESSELS.

What steam is to an engine, blood is to the human or animal body. Whenever any of the more important vessels holding or conducting steam become injured, the vapor escapes, the engine stops. Likewise when any of the larger bloodvessels in the body become separated, and their contents are allowed to escape, the body collapses—life becomes extinct.

But unlike the former, a work of man, it can be repaired, even if all the steam has left its housing. Motion can be re-established through water and fuel. Allow, however, a certain amount of blood to escape from the body, no human can make the repair, for the machinery necessary to convert food and drink into blood is beyond recuperation.

Ever since physiology has been recognized as a science, the searchers in this field have demonstrated that blood is all important, and have shown it to be of the most intimate connection with the phenomena of animal life.

Blood exists in an abundance in the normal human body, and occupies about one-eighth of the whole by weight. As a highly organized fluid of the body, it provides material for generation of all parts, excepting none; it receives the product of waste and carries it to the proper eliminating organs—lungs, kidneys, skin.

In this difficult labor, or in the functions blood per-

forms, the uneducated would naturally come to the conclusion that even blood itself wears out and loses its nutrient qualities, but nay, in the acts of life blood receives food from what we eat, and is regenerated, and becomes purified through the air we are allowed to inhale at no cost to our pocketbooks, provided we are not too particular about the kind.

As previously remarked, the proportion of blood in the human body is about 1 to 8, which has been actually demonstrated by Professors Lehmann and Weber of Germany, on bodies of decapitated criminals, by first weighing them, after decapitation extracting all blood possible, and then weighing the remaining tissues.

The Blood is a somewhat thickish, opaque fluid, of a bright red or scarlet color when it flows from the arteries, or of a dark red or purple color when it flows from the veins. It is viscid and has something like a clammy feeling to the touch. When taken into the mouth, it reveals the fact that salt or saline matters are among its constituents. It is further characterized by a peculiar faint odor, which may be developed to be very distinct in blood from the lower animals by adding to it a few drops of sulphuric acid, through which it assumes the odor peculiar to the animal from which it came. In order to become acquainted in what manner blood accomplishes such important functions in life, it will be necessary to recapitulate the far reaching investigations made by eminent scientists, as to what are the constituents of blood. While as early as 1661 A. D., the celebrated anatomist, Malphighi of Italy (born 1628, died 1694), in examining the blood of a hedgehog, with the imperfect magnifying glasses at his command, discovered little floating particles in the blood; he mistook them for globules of fat, but which in reality were the *blood corpuscles*. These little bodies are held in suspense in a colorless liquor, called the *plasma* or *liquor sanguinis*. Of these two constituents, blood consists.

Of *corpuscles*, two varieties are known to exist, the *red* and the *whites* or *leucocytes*. The former are by far the most abundant, and constitute about one-half of the mass of blood. The white corpuscles are in a great minority, and their ratio to the red is about 1 to 4 or 500. Indefinite, we acknowledge, but not of sufficient importance to waste time in a more accurate investigation.

Red Corpuscles. From these the blood derives its color and opacity. These little bodies are true organized structures, containing all the elements requisite for the purpose. They are more abundant in the blood of the males than in that of the females. The form of the corpuscles is peculiar, namely: flattened, biconcave circular discs; their thickness varies from one-fourth to one-third of their diameter. They are also extremely elastic, and though deformed through pressure, will assume immediately their former shape as soon as freed. While suspended in the plasma, they have a tendency to arrange themselves in rows, like a stack of coin. Their average diameter, according to Robin, is $\frac{1}{3437}$ of an inch; others claim that it is less, and in the neighborhood of $\frac{1}{3500}$ of an inch.

Interesting researches have been made of the different sizes of corpuscles in different animals, and from it we recapitulate the following:

Human Blood	$\frac{1}{3500}$
Elephant	$\frac{1}{2745}$
Mouse	$\frac{1}{3814}$
Musk Deer of Java	$\frac{1}{12325}$
Frog (average)	$\frac{1}{1465}$

From these interesting data it seems to be evident that the size of the corpuscle is entirely independent of the size of the animal from which it was obtained.

The number of corpuscles in a given quantity of blood is something enormous, and according to the latest and most authentic researches made in this matter, by Prof. Melassez of France, the number in one cubic millimeter

(about equal to $\frac{1}{25}$ of a cubic inch), the number is estimated at about four millions.

The principal function of the corpuscles is that of carriers of oxygen and carbonic acid. (On this subject further remarks will be made when the functions of respiration are considered.) This is especially attributed to the red corpuscles, and in their affinity for these two gases a greater one seems to exist for the oxygen, which they carry to all the tissues of the body, and take away the carbonic acid, delivering it to the lungs to be eliminated by expiration.

Of the specific functions of the white corpuscles the scientific world seems to be at war, and all the theories advanced lack confirmation.

Of all the chemical researches, there are perhaps no data which furnish so much food for thought as an analysis of human blood.

In it we recognize again the food and drink we have taken, and find no trace of articles frequently used without forming in whole or in part a constituent of blood. Hence by a careful perusal we can learn from it what we should eat and drink, and especially what we should leave untouched.

The average composition of blood, according to the most careful analysis, is as follows:

Water	902.00
Albumen	53.00
Paraglobuline	22.00
Fibrinogen	3.00
Fatty matters	2.50
Nitrogenous matters	4.00
Organic ingredients	5.00
Chloride of sodium (common salt)	3.50
Chloride of potassium	0.35
Sulphates	0.30
Phosphates	1.35

Lime	1.50
Magnesia	1.50
	1000.00

Of these substances water predominates, but it holds in suspense the excrementitious matters, such as carbonic acid in solution, which is eliminated by the lungs and skin; all the constituents of the urine, mainly urea, which are carried away through the kidneys. Water also holds in suspense, in the proportion of 28 to 1,000, peptone, which is used in the economy of the system during digestion.

Of *Albumen* in the blood, it is justifiable to remark that it takes first rank in nutrition; it is found in nearly all articles of diet in the proportion as is stated in the tabulated statement of nutritious qualities of dietary substances.

Paraglobuline exists in the blood in about half the quantity as albumen, and is closely allied to it, in its chemical relations.

Fibrinogen is also an albuminous substance, only differing from the two former slightly in its chemical composition. Combined with the former, or if subjected to heat, it causes coagulation.

Fatty matters of the blood are in largest abundance soon after digestion of food, rich in oily substances. The emulsionized fat finds its way into the blood, and circulates for a time unchanged. Afterward it gradually disappears from the circulation, being either deposited in the fatty tissues or transformed into other products of assimilation.

The *Mineral Salts* of the blood are principally chloride of sodium and potassium, phosphates, sulphates, together with lime and magnesium. Of these chloride of sodium, otherwise known as common salt, is the most abundant. The phosphates are of great importance for their influence upon the blood in giving it an alkaline tendency, a

property which is essential to the functions of nutrition and even to the immediate continuance of life, since it enables the absorption of carbonic acid by the blood in the circulation of the capillaries, and returns it to the lungs for elimination.

Tiresome and technical as it may appear to the reader, it is his duty to acquire some knowledge of the composition of his blood, in fact in order to enjoy health he must inform himself in reference to what is good for him, and what is not. Hence, the more detailed description of the components of the nutrient fluid, upon which the material body subsists. Blood containing a correct proportion of the ingredients mentioned can be considered in a state of health, and with it the body. When, however, they become disproportionate, disease is apt to ensue, hence, it is the duty of every one for himself and those dependent upon him or her to see to it that food containing the required substances for the regeneration of the blood are supplied. The discussion of the articles which possess this virtue, belongs however to the functions of digestion, and the reader is referred to that chapter if he be ignorant of a proper dietary list.

Blood possesses the remarkable property of spontaneous coagulation, a subject which has been under investigation since the middle of the seventeenth century. All the great and good men, who have given their time and knowledge to this subject have come to the conclusion that the blood will coagulate, but are unable to establish definitely the cause of it.

Unexplainable as it is, the coagulation of blood is taken into advantage in the treatment of wounds and diseases, such as the arrest of hemorrhages in cases of laceration, cuts and bruises.

From the foregoing it is hoped the reader has learned what blood is and what its general functions are, but in order to ascertain how and in what manner this nutrient

fluid performs its duties we have to take a mental trip of its journey through the vessels, and learn this by studying the physiological anatomy of the

HEART, ARTERIES, CAPILLARIES AND VEINS.

The Heart is a hollow muscular organ of a conical form somewhat in the shape of a pear, placed between the lungs and inclosed in the cavity of the *pericardium*. It is situated nearly in the middle of the thoracic cavity, its base in the median line and its apex about three inches to the left of the center line of the breast bone, or one inch within the line of the left nipple. The prevailing idea that the heart is nearly or entirely in the left side of chest is an erroneous one. It is by reason of this anatomical mistake that murderers or individuals wishing to commit suicide, frequently plunge their weapon into the left lung without reaching the heart.

The heart is held in place through its attachment to the great bloodvessels, which in turn are connected to the posterior wall of the thorax. The apex of the heart is free and capable of a certain degree of motion.

In the matter of weight of the heart a difference exists between that of the male and female. In that of the former it varies between ten and twelve ounces, while that of the latter is between eight and ten ounces. It is however, erroneous to assume that the heart of the female is the smaller of the two, for it must be borne in mind that the average weight of man is more than that of woman, and looking at it from this standpoint the heart of woman is larger than that of the male, which is further brought to light from data furnished by Dr. Gray of London, who gives the proportion of the heart to the whole body as follows :

In man..... 1 to 169
In woman..... 1 to 149

The heart is inclosed in a fibrous sack called the *Pericardium*, which signifies "peri" about and "kardia" heart, derived from the Greek. This sack also envelopes the commencement of the large bloodvessels terminating in its substance. The pericardium is lined by a serous membrane secreting a fluid which serves as a lubricant to the outer surface of the heart. This admits of movements without any friction.

The heart is divided into four cavities indicated upon its surface by grooves. It has one longitudinal muscular partition or *septum*, separating the right from the left heart. Each of these is separated by valves, and in that manner the four cavities are formed.

1. The *Right Auricle* is a little larger than the left, and its walls somewhat thinner. It receives the venous blood from all parts of the body through the upper and lower venæ cavæ and empties it through the right auriculo-ventricular opening, which is guarded by the tricuspid valve into:

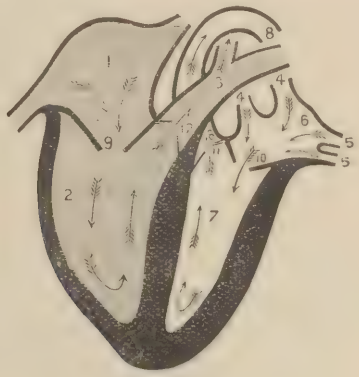
2. The *Right Ventricle*, a cavity of similar dimension as the former, holding about three fluid ounces. From this receptacle the blood is forced into the lungs through the pulmonary arteries for purification purposes, and from where it returns imbued with oxygen, through the right and left pulmonary veins entering the heart at:

3. The *Left Auricle*, which, after receiving the blood from the lungs propels it through the left auriculo-ventricular opening, presided over by the biscuspid valve into:

4. The *Left Ventricle*, the walls of which are uniformly much thicker than that of its right namesake, and doubtless so constructed that through its muscular action the blood is forced throughout the arterial system of the body by way of the *Aorta* or great artery.

The heart in its capacity as a force pump which feeds itself, and as shown on the schematic diagram (Eng. No.

9), giving an idea of the manner and form the valves close, gives much food for study in its phenomenal action.



Engraving No. 9.

Valvular Action of the Heart.

1. Right Auricle
2. Right Ventricle.
3. Pulmonary Artery.
4. Left Pulmonary Veins.
5. Right Pulmonary Veins.
6. Left Auricle.
7. Left Ventricle.
8. Aorta.
9. Right auriculo-ventricular opening (Tricuspid Valve).
10. Left auriculo-ventricular opening (Biscuspid or Mitral Valve).
11. Aortic Valve.
12. Pulmonic Valve.

In doing so we must follow the flow of the blood as it enters the auricles. The dilatation of the cavities of the heart is called the *diastole*, and the contraction is named the *systole*. When these terms are used without any prefix, they refer to the actions of the ventricles, but they are also applied to the actions of the upper cavities, and are then named auricular diastole or systole respectively.

A complete revolution of the heart consists of the filling and emptying of all its cavities, during which an alternation of repose and activity is experienced.

Action of the Auricles. These cavities are continuously receiving blood on the right side from the venous system, and on the left side from the lungs by the pulmonary veins. This action is however interrupted for a very short period during contraction. The flow continues until the cavities of the auricles are completely filled, the

blood coming in by a steady current, and during the repose of the heart the blood flows also into the ventricles through the auriculo-ventricular openings. When the auricles have become fully distended and taken in all the blood they can hold, they contract quickly with considerable power (thus forming an auricular systole), and force the blood into the ventricles, producing a complete diastole of these cavities. During this contraction of the auricles the blood ceases to flow into them.

Action of the Ventricles. Immediately after the contraction of the auricles which caused the complete filling of the ventricles, these also contract, which is the chief action of the heart, and is generally spoken of as the *systole.* As soon as the systole is accomplished the heart has a period of repose during which the auricles fill up again and from there into the ventricles, until the auricles are filled, and another contraction takes place.

During the contraction of the auricles, the biscuspid and tricuspid valves are open, and closed during contraction of the ventricles. Thus preventing return of the blood.

From the foregoing the following deductions of the heart's actions are made. The two auricles contract simultaneously, and the two ventricles do likewise. During the contractions of the auricles, the ventricles are dilating, and vice versa.

The sounds of the heart are caused by contraction of the ventricles and the valvular action incident thereto, its elevation against the sternum, contributes to this manifestation also.

FREQUENCY OF THE HEART'S ACTION.

Much importance has always been attached to this, as it is indicative of the general condition of the whole system.

The frequency with which the heart beats is modified in health to a considerable extent, and is dependent upon

age, sex, muscular activity, the condition of the digestive system, and numerous other causes. This points to the fact that the action of the heart is closely allied to the various functions of the economy, and readily sympathizes with their derangement. Each ventricular contraction is followed by an expansion of the arteries readily noticed by the touch on one of them, and by it, it is far easier to observe the heart's action, than by exploring that organ itself.

The *pulse* becomes therefore an exact criterion of the action of the heart. The variations as to age and sex have been carefully observed by Dr. Guy of London, and we herewith submit the tabulated statement made by him of the frequency of the beats of the heart per minute.

Age.	Males.	Females.
At birth.	130	140
At one year.	120	130
From 2 to 7 years.	97	98
" 8 " 14 "	84	94
" 14 " 21 "	76	82
" 21 " 28 "	73	80
" 28 " 35 "	70	78
" 35 " 42 "	68	78
" 42 " 49 "	70	77
" 49 " 56 "	67	76
" 56 " 63 "	68	77
" 63 " 70 "	70	78
" 70 " 77 "	67	81
" 77 " 84 "	71	82

Influence of Digestion. That the condition of the digestive system has a marked influence on the rapidity of the pulse and specially so within five or ten minutes after a meal, every one can observe on himself and find that the pulse has increased from 6 to 12 beats per minute over the normal scale. Abstinence from food for a considerable length of time has the opposite effect, and diminishes the frequency of the pulse from 12 to 15

beats. Alcohol and its many allied beverages first diminishes and after some little time accelerates the pulse and causes variations in the flow of the blood, which soon impairs its usefulness, if persisted in. Coffee, especially strong black coffee accelerates the pulse and is often taken advantage of for this quality by medical practitioners. Of food in general, animal has a tendency to accelerate to a greater degree the rapidity of the pulse, than vegetable articles of diet.

Influence of Posture and Muscular Exertion. The position of the body has a very marked influence upon the rapidity of the pulse. The investigations by Dr. Guy of London, are of an interesting character, and may be of service to the reader, in the endeavor to lessen the heart's action, on himself or on those whose health is in his keeping. The difference is due to the position of the body alone and in one observation Dr. Guy found that the pulse in a standing position was 89 beats; lying down 77; hence a difference of 12 beats. This enormous difference is due to the muscular effort which is required to keep the body in the posture named.

Dr. Austin Flint, Jr., reports differences as follows:

1. Erect posture without support and leaning in same posture, 12 beats per minute.

2. Recumbent position fully supported and only partially so, 14 beats per minute.

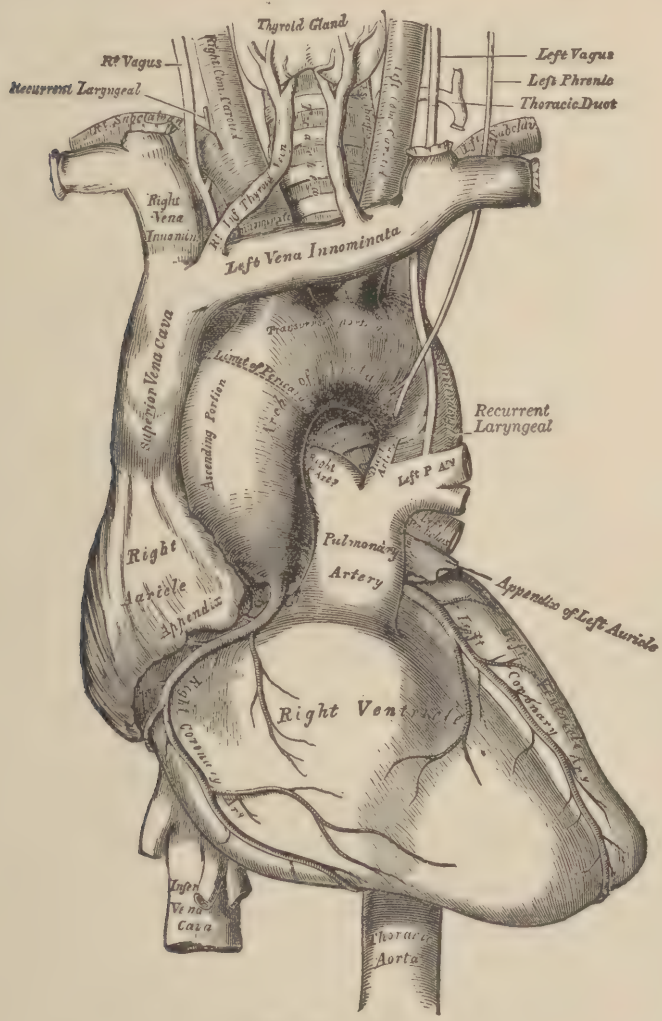
3. Sitting posture, back supported, 80; not supported, 87; difference 7 beats.

4. Sitting posture with legs raised at right angles with the body, back unsupported, 86; supported 68, difference 18 beats.

Exercise has a strong tendency to accelerate the pulse.

The Influence of Temperature is so marked, that if a body is exposed to extreme heat for a very few minutes only, the pulse may be doubled. It may be considerably reduced by a cold douche or shower bath.

The Nervous System has considerable influence upon the *actions of the heart*, notwithstanding that we cannot control its movements by the will. The organ itself is



Engraving No. 10.

The Heart and the Arch of the Aorta.

void of general sensibility, and was shown to be so, as early as Harvey's time (1578-1658), by this eminent anatomist, when he demonstrated before Charles I, by

making that monarch touch the heart of Viscount Montgomery, which had been laid bare by a wound in the breast bone. The pain which is often referred to the heart is most commonly produced by a simple neuralgia of the thoracic wall.

Notwithstanding this insensibility and in spite of the fact that the muscular fibers composing it are contractile, the physiological movements of the heart are capable of being influenced to a remarkable degree, through the nervous system. For do we not know, that emotion, fear, anxiety, joy, and numerous other acts emanating from the nerve centers, make the heart flutter, beat slower or faster? It is also, owing to the facility with which the emotions of the mind act upon the heart, that we attribute to this organ all the sentiments we feel. And this is so universal among civilized as well as those who are not, that one finds expressions in all languages, in sayings and proverbs, which make the heart the source of our passions, hence the expressions: a heartless man, a hard heart, a good heart, a brave and noble heart, a broken heart, to characterize selfishness, goodness, courage, generosity and sorrow.

In the same sense, Vauvenargues has said, "All great thoughts come from the heart."

In order that the anatomy of the heart and its intimate connection with the great bloodvessels be easier comprehended, we invite the reader's careful study of the engraving of that organ, together with the aorta, its arch and other arteries and veins in its immediate vicinity.

The Arteries are cylindrical tubular vessels, which serve to convey the blood from both ventricles of the heart to every part of the body. These vessels were named "arteries," which means "to contain air," from the belief entertained by the ancients that they did so. This erroneous belief was based upon the fact that most of the arteries are empty after death.

The *pulmonary* or *lung* artery which arises from the right ventricle, carries venous blood directly into the lungs, whence it is returned by the *pulmonary veins* to the left auricle. This constitutes the "lesser," or *pulmonic* circulation.

The great artery, usually called the *aorta*, conveys arterial blood to the body, whence it is brought back to the heart by the veins. This constitutes the "greater," or systemic circulation.

The distribution of the systemic arteries is like a highly ramified tree, the common trunk of which is formed by the aorta, which commences at the left ventricle of the heart. Arteries are found in all parts of the body, with the exception of the hairs, nails, epidermis, cartilage and the cornea. The larger trunks occupy usually positions, where they are not much exposed to injury.

Arteries in their distribution communicate freely with one another, forming what is called "*anastomosis*" or inosculations. This is especially the case when great freedom and activity is necessary, as in the brain, the abdomen, the limbs, etc., etc.

These inosculations are of great interest to the surgeon, as it is by their enlargement that a collateral circulation is established after the application of a ligature to an artery. The smaller arteries inosculate more frequently than the larger, and between the smallest twigs, these anastomosis become so numerous as to constitute a close network which pervades nearly every tissue of the body.

Arteries are dense in structure, of considerable strength, highly elastic, and when divided, although empty they preserve their cylindrical form.

In studying the location of the arteries the reader is urged to impress upon his mind the graphic illustrations upon the subject, not only the heart and its closely connected vessels on preceding page (No. 10), but also the plate, showing the formation, oxygenation and circulation

of the blood throughout the body, in the vessels as shown in engraving No. 11. From it also the names and approximate locations of these vessels can be ascertained. The object lesson which can be gained from this plate ought to be vividly graven upon the tablet of memory, and then the course of the blood through the arteries, as explained in next paragraph, will be better understood and appreciated.

The *Aorta* or *Great artery* is the main trunk of a series of bloodvessels, which, arising from the heart, convey the red oxygenated blood to every part of the body for its nutrition. This artery commences at the upper part of the left ventricle, and after ascending for a short distance, as shown in engraving No. 10, arches backward and to the left side of the vertebral column. In descending it passes through the diaphragm into the abdominal cavity, where it divides about opposite the fourth lumbar vertebra, forming the right and left *iliac* or flank arteries.

That part of the aorta before it arches, is called the "Ascending," the next section the "Arch," after its curvature downward till it reaches the diaphragm, the "Descending thoracic" and from there to its bifurcation the "Descending abdominal aorta."

From the arch three important branches arise; one on the right side, called the *innominate* artery, is the largest branch given from the arch, and after ascending, differing in different individuals, divides into the *right carotid* and the *right* subclavian arteries. The *left carotid* and the *left subclavian* arteries ascend direct from the arch, the former in the middle and the latter on the farthest to the right. The two *carotid arteries* need more than a passing notice, for after ascending to about the angle of the jaw, each branches into two stems; one brings the life's nutrient fluid to the brain, the internal, while the other sustains the vitality of the face and outer portions of the cranium. Shut off the main trunks of these arteries, and the func-

tions of the seat of our sensibilities cease, and the expressions in the Creator's image become ghastly.

The two *subclavian arteries* bring new food for our shoulders, arms and hands, which enables them in their avocations to pursue labor for gain, to defend us from encroachment, and to embrace those who are dear and near to us.

From the abdominal aorta, as soon as it reaches that cavity, three branches are given off, on the right, the *hepatic* or liver artery and on left the *gastric* or stomach, and *splenic* or spleen arteries. A little below this, the *upper mesenteric* artery leaves the main stem, to carry blood to the intestines. A short distance farther down, one large branch is thrown off for each kidney, forming the *renal* arteries. Half way between last branches and place of bifurcation, the *lower mesenteric* artery leaves, performing like service as the upper.

Returning to the right and left iliac arteries and following them for a short distance, we find that each separates into two branches, the internal iliac carrying blood to the pelvis, and the external iliac which descends into the thigh, and when there is called the *femoral* artery, throwing off branches for the carrying of sustenance to that part. It inclines toward the back part of it a little above the knee. It pursues its descending course after dividing and redividing in the body of the leg, giving off branches large and small, so that every part needing new material for the rebuilding of worn out tissue is properly supplied.

All the arteries appertaining to the systemic circulation arise from the heart by one stem namely, the aorta, which has its largest diameter just as it leaves the heart. This trunk and its branches decrease in size in their ascent and descent from that organ, proportionate to the distance and in conformity to the number of branches given, till they reach their extremities, where they become so small as not to be visible to the naked eye.

The Capillaries. The word is derived from the Latin "capillus" a hair, but as this does not signify its office, a definition as to the functions of this class of bloodvessels becomes apparent. The capillaries are to be regarded as commencing at the point where the blood is brought near enough to the tissues to enable them to separate from the blood the elements necessary for their regeneration, and to give up the products of their decay. With the knowledge at present at command of the learned, it is impossible to say exactly where the minute arteries cease to be merely carriers of blood or where they commence to deliver new sustenance, and pick up waste matter.

The outside diameter of the capillaries is generally as small or may even be smaller than the blood corpuscles which pass through them. Persons acquainted with the use of the microscope can observe this most interesting phenomenon in the web of a frog's foot, and can see that the little corpuscles move in a single line and become deformed while passing through capillaries which are smaller than the corpuscles.

The capillaries are smallest in the nervous and muscular tissues, the retina of the eye and certain places in the small intestine called the patches of Peyer, where they have a diameter from $\frac{1}{6000}$ to $\frac{1}{4000}$ of an inch. In the mucous layers of the skin and in the mucous membranes, they are from $\frac{1}{4000}$ to $\frac{1}{2500}$ of an inch in diameter. The largest are found in the glands and bones where they are from $\frac{1}{3000}$ to $\frac{1}{2000}$ of an inch in diameter. The measurements indicate the outside diameter.

These capillaries form true networks of nearly uniform diameter, and do not grow smaller like the arteries in their branches, or become larger like the veins when receiving new tributaries. Their mode of inosculation is peculiar to these vessels, and the capillary network is rich in the tissues as a general rule, in proportion to the

activity of their nutrition. The meshes of the capillary network in the lungs are very close, but in other parts are not so dense and present great variations.

In the muscles and nerves in which nutrition is very active, the supply of blood is much more abundant than in other parts like serous membranes, tendons, etc., in consequence the capillary network is more dense.

The capillaries commence where the arteries end, and terminate at the beginning of the veins and thus form a connecting link between the bloodvessels, carrying blood from the heart, the arteries, and the vessels, returning it to that organ, the veins. They are so dense in nearly all parts of the body that it would be difficult to introduce a cambric needle without wounding one of these minute vessels.

The Veins are the vessels which serve to return the blood from the capillaries of the different parts of the body to the heart, and in their approach to that organ increase in size until at last they form two large trunks of all the tributaries from all regions of the body, namely, the upper and lower *venæ cavæ*. This, like in the case of the arteries forms the systemic venous circulation.

The blood from the head is returned by the right and left *jugular* veins, and their tributaries; from the arms by the two *subclavian* veins and their affluents, forming the upper *vena cava*.

The blood from the lower extremities is gathered by the *femoral* veins and its tributaries, which after they ascend into the abdomen, form the *external iliac* veins. The latter two unite with the internal *iliac* veins, bringing blood from the pelvis, and form the *common iliac* veins, right and left. These two veins unite in about the same place where the aorta bifurcates and form the *lower vena cava*. This latter trunk in its ascent receives only two tributaries direct throughout the abdominal cavity, namely, the *renal* veins, returning the blood from the two kid-

INTERNAL ORGANS.

(Engraving No. 11.)

Organs of Digestion.

1. Œsophagus or Gullet.
2. Stomach. A. cardiac. B. pyloric opening.
3. Duodenum.
4. Section of Small Intestine.
5. Cæcum.
6. Ilio-cæcal Valve.
7. Ascending Colon.
8. Section of Transverse Colon.
9. Descending Colon.
10. Sigmoid Flexure.
11. Rectum.

Accessory Digestive Organs.

12. Liver. C. right lobe. D. left lobe.
13. Gall Bladder.
14. Bile Duct.
15. Spleen.
16. Pancreas.
17. Pancreatic Duct.
18. Common Duct. (Union).

Urinary Organs.

19. Kidneys.
20. Ureters.
21. Upper portion of Bladder Lower portion removed to show rectum.

Respiratory Organs.

22. Trachea. Lower portion.
23. Bronchi.
24. Lungs. E. upper, F. middle, G. lower, lobes of right lung. H. upper, I. lower, lobes of left lung.

Circulatory Organs.

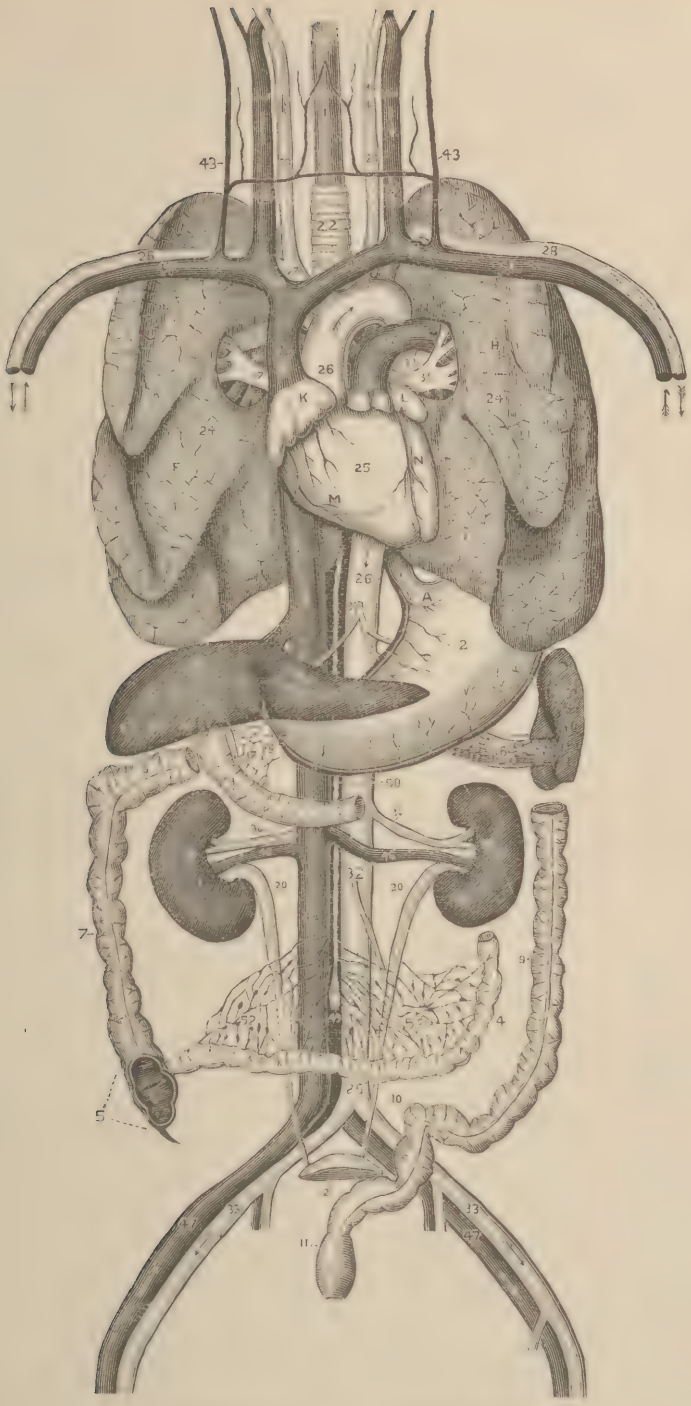
25. Heart. K. right auricle, L. left auricle, M. right auricle, N. left auricle.
26. Aorta.
27. Innominate Artery.
28. Subclavian Arteries.
29. Common Carotid Arteries.
30. Renal Arteries.
31. Cœliac Axis, giving branches to Stomach, Liver and Spleen.
32. Mesenteric Artery, giving blood to intestines.
33. Iliac Arteries.
34. Left Pulmonary Artery.
35. Right Pulmonary Artery.
36. Left Pulmonary Vein.
37. Right Pulmonary Vein.

} Lesser Circulation.

38. Upper Vena Cava.
39. Right Innominate Vein.
40. Left Innominate Vein.
41. Subclavian Veins.
42. Internal Jugular Veins.
43. External Jugular Veins.
44. Lower Vena Cava.
45. Hepatic or Liver Vein.
46. Renal Veins.
47. Iliac Veins.
48. Portal Vein (tributaries cut off). This vein gathers all the blood from the viscera of digestion.

Miscellaneous Organs.

49. Chyle Receptacle (lower part of thoracic duct).
50. Thoracic Duct.
51. Entrance of Thoracic Duct into Subclavian Vein.
52. Mesenteria, showing Glands and Vessels leading to Thoracic Duct.



Engraving No. 11. Internal Organs.

neys relieved of the urine. The blood returned from the digestive apparatus is gathered by the *splenic*, *gastric*, *mesenteric* and *pancreatic* veins which unite in the *portal* vein and deliver the blood into the largest gland of the body, *the liver*, where it becomes relieved of the bile, then passes out of that organ by way of the *hepatic* or *liver* veins into the lower vena cava, just before its penetration of the diaphragm. The last described collection of blood forms what is usually called the *portal circulation*. Veins are abundantly supplied with valves which facilitate the return of the blood to the heart.

MECHANISM OF CIRCULATION.

Dr. Wm. Harvey (England), discovered the circulation of the blood in 1616, A. D. As early, however, as 1553 A. D., Michael Servetus drew attention to the pulmonary circulation and embodied his discoveries in a theological work, not however, for the promulgation of physiological facts, but for the development of a theory with regard to the formation of the soul.

The mechanism of the circulation is as follows: The venous blood flowing from all the regions of the body arrives by the two venæ cavæ into the right auricle, and from there it flows into the right ventricle, which propels it into the pulmonary artery, the ramifications of which are distributed in the substance of the lungs. It is in the lungs, that the dark venous blood, through the absorption of oxygen in the air, becomes red or arterial, and thus modified, it returns by the pulmonary veins into the left auricle from where it passes into the left ventricle. The contractions of the left ventricle propel the current of blood into the aorta and, thence into the whole of the arterial system as far as the capillaries, where the blood leaves its nutritive qualities in the tissues of the economy. From the capillaries it returns at last to the heart by the veins, which were selected as a point of departure of this circular

journey. The heart may therefore be justly compared to a forcing pump which feeds itself.

The blood takes only about thirty seconds to make the entire round of circulation, and consequently in twenty-four hours a blood corpuscle traverses 2880 times the double circulatory circle, which is equal to a speed of about seventeen miles an hour, or 408 miles in twenty-four.

CHAPTER VI.

THE DIGESTIVE SYSTEM.

One of the inevitable conditions of life, is that in the organism of the human body and other animals a constant change is taking place, which may be termed a physiological decay. Even the smallest particles gradually die and in turn are replaced by new ones, so that every part having all the external appearances and signs of the former whole, is after a certain time in reality composed of new materials. This process is necessary, and while it may be increased or retarded in its activity, it cannot be arrested during life.

The excrementitious principles which are thus formed are produced constantly by the tissues and must be constantly removed from the organism, otherwise they accumulate and induce a serious poisoned condition. Examples of this are found in those diseases of the kidneys, which interefere with the elimination of urea, producing uræmic poisoning, and in the diseases of the liver, which interfere with the discharge of bile giving cause to serious disturbances in the whole system.

As is evidenced by the amount of matter daily discharged from the body, the process of disassimilation is a very active one. This constant operation necessitates appropriation of new matter by the parts in order that a proper composition may be maintained therein, and be always ready to perform their functions in the economy.

The blood contains all the principles necessary for

the regeneration of the organism. Whereas the physiological decay of the organism is constantly repaired by the blood, the materials which it is constantly losing in this recuperative process must be replaced from some source out of the body, and this necessitates the ingestion of food; otherwise the great nutritive fluid would become impoverished and incapable to perform the multitude of functions of its office.

We partake of food in obedience to a want on the part of the system, which is expressed by a sensation known as hunger, when it relates to solid or semi-solid matters, and thirst when it relates to water. As these sensations constitute the first cause of the introduction of materials capable of regenerating the blood, their consideration naturally precedes the study of digestion, the process by which these articles of food are prepared for absorption and appropriation by the circulating fluid.

Hunger and Thirst. That peculiar want felt by the system, which causes us to partake of nutritive principles, may be properly termed *hunger*. The first manifestation of it is perhaps best expressed by the term *appetite*, not in the least a disagreeable sensation, and one which may be excited by sight, smell, or the recollection of a savory dish, and not always at times when actual need exists for the articles by the system. Appetite is influenced by habit, as we all know, that it returns about meal times. When food has been placed in the stomach the appetite disappears and gives place to a sense of satisfaction which accompanies the undisturbed and normal action of the digestive organs. In those people who do not even allow themselves proper time to eat, and are absorbed in other thoughts, this sense of satisfaction is absent and the only change experienced is that the desire for food has disappeared.

In the human family the appetite is usually manifested to a marked degree two or three times daily. This rule

holds good with the adult rather than in childhood, where the system needs not only material for the worn out tissues, but also for growth, food is taken oftener and in relatively larger quantities than by the adult. Infants should take food at least seven or eight times a day (twenty-four hours); any restriction in this, usually causes great detriment in a growing child. Parents are morally responsible for the proper development of their offspring and the least they can do is to see that the food the little one partakes of is of good quality and unrestricted quantity.

Temperature subjects the appetite to important modifications. In cold climates and during the winter season in all climates the desire for food is notably increased and taste somewhat modified. Animal food and especially fats are more agreeable at that time, and the quantity demanded by the system is usually an increased one. Mental and physical exercise and occupation when not practiced to a point of exhaustion, foster the desire for food, and are the best digestive condiments.

Alcoholic beverages, especially those which are designated by the term "stomach bitters," have a tendency to create an appetite. Before you resort to this unnatural expedient give us your attention and take warning that it is not a healthy appetite, and if you persist in the practice, either in the shape of an "eye opener" in the morning or an "appetizer" for dinner or supper you will soon find out that you have ruined your digestive apparatus and the agreeable sensation of hunger is only a reminiscence. *Alcohol* is neither food or drink, it cannot become a component part of the blood, and leaves the body in a vapor without having contributed anything to its well being.

It disturbs the functions of the stomach, consequently impedes digestion. The use of alcohol in any shape leads to abuse, and the latter will take away all desire for food.

If we do not heed the demands of the system as expressed by appetite, the sensation of hunger becomes distressing, and manifested by a peculiar and indescribable feeling which soon makes itself known by a pain in the stomach. This is usually accompanied by pain in the head, and a general feeling of distress. The imperative demand for food if not soon satisfied, establishes in the mind a doubtful idea of existence. The moral and intellectual feelings if overcome by starvation, give place and full play to a purely animal feeling. There is a demand on the part of the system that the extremity of hunger and thirst must be satisfied if within the range of possibility. The numerous instances in which cannibalism has been resorted to when starvation was imminent, is sufficient evidence of the furious delirium which supervenes after a few days of complete abstinence from food.

Instances of sublime resignation to the terrible agony incident to approaching starvation are on record, but these are rare in comparison with the examples of frightful expedients to satisfy the demands of nature.

Hunger, as experienced in the normal state, is simply a notification that material is needed for the regeneration of the blood. That its seat is not in the stomach entirely, is proven by the fact that persons suffering from organic disease of the stomach have still an appetite, and become hungry, which sensations are satisfied in a measure by the injection of nutritive substances into the rectum.

Thirst is a sensation which induces us to partake of water. The feeling of thirst, if moderate, is rather indefinite, and accompanied by a sense of dryness and heat in the throat. Habit has thirst very much under its influence, as can be easily observed by the difference in desire for liquid in different persons. In some, two or three times a day suffices, while others have oftener a desire for water. Thirst is sensibly influenced by the condition of the atmosphere, as regards moisture, by exercise, and by influences

which discharge water from the body, particularly the process of perspiration. Loss of considerable amount of blood, or operations accompanied by excessive hæmorrhages, cause thirst. The system has a more imperative demand for water than for solids; this substance being second to the demand for oxygen. Persons having an abundance of solid food, but no water, will not survive more than a few days. Water is of the utmost importance to the functions of nutrition, and acts as a solvent in removing from the system such particles as cannot be assimilated.

After total deprivation of water for a considerable time, the thirst becomes intense, and almost agonizing; fever ensues, the blood becomes thickened, consequently diminished in quantity; the urine is scanty and scalding, and signs of inflammation make their appearance. Death takes place in a few days, generally preceded by delirium.

The seat of thirst is instinctively referred to as in the mouth and throat, but not necessarily appeased by the passing of water over these parts, as it may be effectually relieved by the introduction of water into the system by other channels. To alleviate thirst, water must be absorbed by the system.

Alimentation is the act or process of affording nutriment, and under the name of aliment, in its widest signification, it is proposed to include all articles composed of, or containing elements in a form, which enables them to be used for the nourishment of the body under the following circumstances, as being appropriated by the organism; by their favorable influence upon nutrition, or by retarding disassimilation.

By the definition of aliment, nothing is excluded which contributes to nutrition. The air must be considered in this light, as well as water and all articles which are commonly called drink.

The alimentary principles belong to the inorganic,

vegetable and animal kingdoms, and are usually divided into three classes:

1. Organic nitrogenized principles.
2. Organic non-nitrogenized principles.
3. Inorganic principles.

To the first class belongs *muscaline*, which is an *albumen*, formed from the albuminous matter of lean flesh by the action of dilute acid.

Albumen, as an article of diet, and as found in the animal and vegetable kingdom, is of much importance, inasmuch as it constitutes the nutritive principles of the blood, and is the substance into which all the principles of this class which exist in food are converted before they are applied to the nutrition of the tissues. The white of eggs is nearly pure albumen.

Caseine is only found in milk, and constitutes at a certain period of life the sole article of food.

Fibrine is also an albuminous substance, formed from the coagulation of blood; to this also belongs the yolk of egg.

Gluten is the highly nutritive substance found in grain, especially wheat. The nutritive power of gluten is so great and contains so many alimentary principles that for experiment's sake dogs have been fed and were well nourished by an exclusive diet, and have lived for an indefinite period under it.

Under the second class belongs *sugar*, *starch* and *fat*. They are very important alimentary principles, for the reason that they are exclusively concerned in keeping up the animal temperature by the oxidation of carbon.

Sugar may be found both in the animal and vegetable kingdoms, and before it is taken into blood is converted through the process of digestion into glucose, the chemical composition of which is $C_{12}\ H_{14}\ O_{14}$.

Starch closely resembles sugar in its chemical composition, and is contained in abundance in a great number of

vegetables, notably wheat, rye, corn, barley, rice, oats, potatoes, chestnuts, beans, peas, lentils, tapioca, sweet potato and sago.

Starch is insoluble in water, but when boiled with several times its volume of water the granules swell up, become transparent, and fuse together and give it a mucilage like consistency. Upon cooling it becomes more consistent. This change in starch is called hydration, and is interesting as one of the transformations which takes place in the process of digestion, when starch is partaken in the uncooked state. The most interesting properties of starch are connected with its transformation, first into dextrine and finally into glucose. This always takes place before starch can be absorbed into the system.

Fats from the animal kingdom as well as the vegetable realm form important alimentary principles. Before fats can be absorbed by the blood they are emulsionized by alkaline matters furnished by the body.

To class three, pre-eminently belongs *water*, which is one of the most important principles of the organism, and is found in every tissue and part of the body, excepting none. It is introduced with all kinds of foods and is the only drink which quenches thirst. It is taken, as a rule, in greater or less quantity in the pure state, such as it is, for real pure water does not exist in nature. Even rain water contains salts, and frequently a little organic matter.

Chloride of Sodium, is one of the most widely distributed saline substances in the animal and vegetable kingdoms. It exists in nearly all foods, but not in sufficient quantities to satisfy the system; hence its addition to food as a condiment, and for the peculiar flavor it imparts. It promotes secretion of digestive fluids and meets a positive nutritive demand upon the system.

Phosphate of Lime, the bone building substance, is also very abundant, and as common a constituent of vegetable and animal food as salt. It need not be added

to food, as a sufficient quantity is in it for nutritive purposes.

Iron is the coloring matter of the blood. Beyond that which is found in food none should be taken unless prescribed by a physician.

QUANTITY OF FOOD NECESSARY TO NUTRITION.

The old proverb, "Food and drink keep body and soul together," is a good one, and everybody seems to live in accordance with the teachings it conveys. However, it does not answer the question as to how much and what we shall eat, these are circumstances, which we can perceive only through the sensations incident to hunger, and the satisfaction thereof. We must learn to properly estimate these matters.

In the child the nutriment is mainly used as building material for its growing body and to keep up the temperature of it. It is therefore in proportion that the little body needs nourishment as its growth increases

If a child weighs at birth, say 6¾ pounds, its average daily increase is as follows:

During first month	.....	1⅛ ounce.
" second "	.....	1 3/16 "
" third "	.....	⅞ "
" fourth "	.....	¾ "
" fifth "	.....	½ "
" sixth "	.....	9/20 "
" seventh "	.....	⅖ "
" eighth "	.....	⅓ "
" ninth "	.....	⅓ "
" tenth "	.....	2/7 "
" eleventh "	.....	⅔ "
" twelfth "	.....	⅓ "

which brings the whole weight of the body after twelve months to 12½ pounds. Up to the twentieth year the weight increases about twenty fold, figuring from birth, and remains after that about stationary.

From this statement it will be perceived that we should eat and drink daily such quantities as are needed in the economy of the body. Every day which we neglect in doing our duty toward our body cannot be made good, and consequently the change in the tissues is interfered with.

A table of nutriments needed at different periods of life is herewith submitted, which will give an approximate idea of what is necessary to sustain life.

	ALBUMEN.	FAT.	SUGAR.
Child six months old	$\frac{5}{6}$ oz.	$1\frac{1}{3}$ oz.	2 oz.
	(Which is contained in 33 oz. milk.)		
Child two years old	$1\frac{1}{6}$ oz.	$\frac{7}{8}$ oz.	$4\frac{5}{6}$ oz.
Child fifteen years old	$2\frac{1}{3}$ oz.	$1\frac{3}{16}$ oz.	8 oz.
Grown man	$3\frac{3}{4}$ oz.	$1\frac{2}{5}$ oz.	16 oz.
Grown woman	$2\frac{7}{12}$ oz.	$\frac{29}{30}$ oz.	$11\frac{1}{4}$ oz.
In old age	$2\frac{3}{4}$ oz.	$1\frac{5}{8}$ oz.	$9\frac{1}{6}$ oz.

together with such salts and other inorganic principles as the food after preparation contains, and as much liquid as may be demanded by the system.

This must not be understood however, as a cast iron rule as to the quantity of food necessary to maintain the system in a proper condition; for it is evident that it must be greatly modified by habit, climate, the condition of the muscular system, age, etc.

Professor Dalton of New York, made some interesting observations as to the actual amount of food required, and we repeat in his own language the results: "From experiments performed while living on an exclusive diet of bread, fresh meat and butter, with coffee and water for drink, we have found that the entire quantity of food required during twenty-four hours by a man in full health, and taking free exercise in the open air, is as follows:

Meat	16 ounces.
Bread	19 "
Butter or fat	$3\frac{1}{2}$ "
Water	52 fl. "

"That is to say, rather less than two and a half

pounds of solid food, and rather over three pints of liquid food."

The following tabulated statement, showing the value of different aliments, will, it is hoped, be of service in selecting judiciously the food required for a proper sustenance of the body. It is averaged and classified under five heads:

TABLE SHOWING COMPOSITION OF DIFFERENT FOODS.

In 100 Ounces of:	Contain in Ounces.				
	Albumen	Fats.	Sugar forming Elements.	Water.	Salts.
FROM THE ANIMAL KINGDOM.					
Beef, fat	16.9	27.3	.....	54.8	1.0
Beef, lean	20.6	1.5	....	76.7	1.2
Veal, fat	18.9	7.4	.....	72.3	1.3
Veal, lean	19.8	0.8	.....	78.8	0.6
Mutton, fat	14.8	36.4	.....	47.9	0.9
Mutton, medium	18.1	5.8	.....	76.0	1.3
Fresh Pork, fat	14.5	37.3	.....	47.4	0.7
Fresh Pork, lean	19 9	6.4	.....	72.6	1.1
Venison	19.8	2.0	1.4	75.8	1.1
Rabbit	23.3	1.1	0.2	74.2	1.2
Prairie Chicken	25.3	1.4	.....	72.0	1.3
Wild Ducks	22.7	3.1	2.3	70.8	1.1
Chicken	19.0	5.0	1.0	73.0	1.0
Pigeon	22.1	1.0	0.8	73.0	1.0
Goose, fat	15.9	45.6	.....	38.0	0.5
Dried Fresh Codfish	77.9	0.36	1.6	16.2	1.5
Carp, German	20.6	1.1	.....	77.0	1.3
Pike and Pickerel	20.1	0.7	0.9	77.5	0.8
Haddock	17.1	0.4	.....	81.0	1.6
Herring, Salt	19.2	14.7	1.3	46.2	16.8
Lobster	13.6	0.4	0.2	72.7	13.0
Oysters	5.0	0.4	2.6	89.0	2.4
Egg (whole)	12.6	12.1	0.6	73.7	1.1
Milk	3.4	3.7	4.8	87.0	0.7
Milk, Condensed	16.1	12.1	38.9	25.7	2.6
Hog Lard	0.3	99.0	.....	0.7	....
Suet	0.4	98.2	.....	1.2	....
Smoked Ham	24.0	36.5	1.5	28.0	10.1
Dried Beef	27.0	15.4	.....	.....	10.6

In 100 Ounces of:	Contain in Ounces.				
	Albumen.	Fats.	Sugar Forming Elements	Water.	Salts.
FROM THE ANIMAL KINGDOM.					
Butter	0.9	83.1	0.7	14.1	1.2
Cheese	27.6	20.5	2.0	40.0	3.0
Honey, strained	1.3	.....	81.4	16.1	0.1
FROM THE VEGETABLE KINGDOM.					
Wheat Flour	9.0	1.0	74.0	13.0	0.6
Rye Flour	11.0	2.0	69.0	14.0	1.3
Wheat Bread	6.8	0.7	52.0	39.0	2.0
Rye Bread	6.0	0.5	48.0	44.0	1.3
Farina	10.4	0.4	76.0	13.0	0.5
Pearl Barley	7.3	1.2	76.2	13.0	1.2
Cornstarch	1.5	.....	83.3	14.8	0.4
Rice	7.8	0.7	76.4	13.0	0.8
Beans, dried	22.8	2.7	45.4	15.0	2.6
Peas, dried	21.0	2.1	54.2	14.0	2.7
Potatoes, Irish	2.6	0.2	20.6	76.0	1.0
Carrots	1.0	0.2	10.0	87.0	1.0
Kohlrabi	7.0	0.2	9.0	85.0	1.2
Asparagus	2.1	0.3	3.0	93.0	1.5
Oyster Plant	1.0	0.5	14.8	90.4	1.0
Celery	1.5	0.4	11.8	84.0	0.8
Cauliflower	2.5	0.4	5.0	90.4	0.8
Cabbage, red	1.8	0.2	6.0	90.1	0.8
Cabbage, white	2.0	0.2	5.0	90.0	1.2
Spinach	3.2	0.5	3.3	90.3	2.0
Pumpkin and Hubbard Squash	90.0	0.7	0.1	7.3	0.6
Cucumber	1.0	0.1	2.3	96.0	0.4
Melon	1.1	0.6	1.4	95.2	0.6
Tomato	1.3	0.3	4.0	93.0	0.6
Peas, green	5.8	0.5	11.0	80.5	0.8
Beans, green	2.8	0.1	7.6	88.4	0.6
Mushrooms, dried	23.8	1.2	44.2	17.5	7.1
Pears	0.4	.....	12.6	83.0	0.3
Apples	0.4	.....	12.9	83.6	0.3
Grapes	0.6	.....	17.1	78.2	0.5
Plums, green	0.8	.....	11.2	81.2	0.7
Plums, dried	2.6	0.5	48.0	29.8	1.3
MANUFACTURED ARTICLES (from	vege	table	king	dom.)	
Sugar	.....	.....	95.5	3.0	1.5
Syrup	.....	.....	73.0	24.6	2.3
Cocoa	14.9	49.3	21.7	.....	3.7
Beer, Export	0.7	0.3	3.2	95.0	1.0

"Variety is the spice of life," Surely this old adage cannot be better applied than by changing the word "life" to "digestion." The writer does not desire to underestimate the intelligence of the reader by laying down rules as to the change in the various foods, but wishes to add that monotony in food becomes about as tiresome to the appetite as the tune "Marching through Georgia" was to the late General Sherman.

DIGESTION.

Digestion is the function by which foods introduced into the digestive apparatus, are converted into soluble and diffusible products, capable of being absorbed by the blood. This process is caused by both mechanical and chemical means.

In the chapter upon this important subject, we will follow food in a journey through the alimentary canal (commencing at mouth and terminating with the rectum), and thus learn how and by what means foods are converted into blood and how the non-assimilable matters are discharged from the body through the rectum.

The process of digestion comprises seven successive acts, and an anatomical and physiological description of the organs partaking in this process will be made, including those which are accessory.

1. *Prehension of Food.* Every animal is supplied with proper means for this first stage of digestion. Thus man makes use of his hand, the elephant of its trunk, the cat of its teeth and claws, the horse of his lips, the ox of his tongue and the insects of their suckers.

2. *Mastication or Chewing.* This process is solely performed by the teeth, assisted by the muscles of mastication, lips and tongue.

During life two sets of teeth are furnished to the human being, one a temporary set, which are replaced by the permanent teeth.

The temporary teeth are only twenty in number, ten for each jaw, of which four in each jaw are incisors, two canine, and four molars. The other molars, which we find in adults, have no temporary predecessors.

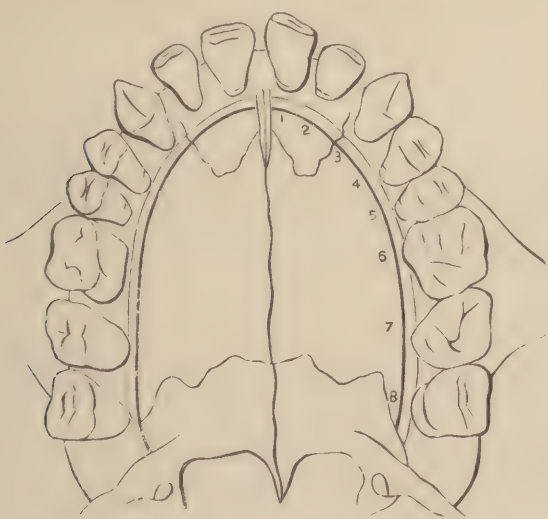
The temporary or milk teeth are developed in the order as shown in the cut No. 12.



Engraving No. 12.
First or Temporary Teeth.

These teeth appear in the following order:

1. 6 to 8 months, Incisor.
2. 7 to 9 months, Incisor.
3. 16 to 24 months, Canine.
4. 12 to 15 months, Molar.
5. 20 to 24 months, Molar.



Engraving No. 13.
Permanent Teeth.

The engraving No. 13 shows the development of the permanent teeth, which make their appearance as follows:

1. 8th year, Incisor.
2. 9th year, Incisor.
3. 11 to 13th year, Canine.
4. 10th year, Molar.
5. 11 to 15th year, Molar.
6. 7th year, Molar
7. 13 to 16th year, Molar.
8. 18 to 30th year, Molar.

The last one is also called the "wisdom" tooth.

Each tooth presents for anatomical description, a crown, a neck, and a root or fang.

The crown projects above the gums and is covered by an enamel, which is by far the hardest structure of the body. In color it is white and glistening, and is thickest on the grinding surface, and becomes thinner in its layer as it approaches the root. By long use of the grinding surface this enamel will wear off.

The roots of the teeth are firmly implanted in the cavities for that purpose in the jaws.

The neck forms the constricted portion between crown and root.

The largest portion of the teeth is composed of a peculiar structure called dentine or ivory. In many respects it resembles bone, but is much harder, and has not in its dentine part any canals.

In the interior of each tooth is a pulp cavity, which contains a collection of bloodvessels and nerve matter, held together by longitudinal fibers of white fibrous tissue. This is the only portion of the tooth endowed with sensibility. At the extremity of the root a little opening exists, through which the bloodvessels and the nerves penetrate.

When any of the permanent teeth are lost, or become worn out or decayed, they are not regenerated. This well-known fact, therefore, furnishes us with hygienic laws which nobody should defy. Mothers, especially, should guard their little ones, and insist upon obedience to their commands for the preservation of the teeth. We refer to the cracking of nuts, etc., which is liable to

chip off parts of the enamel and dentine, thus exposing the internal structure. The alternating of hot and cold fluids, also, has a tendency to crack the enamel.

Comparative anatomy of the organs of mastication makes it evident that the human race is designed to live on a mixed diet, that is, its food is to be taken from both the animal and vegetable kingdoms, notwithstanding the fact that experience has shown that man can be nourished for an indefinite period on a diet composed exclusively of either animal or vegetable principles.

The human family has teeth which are allied both to the carnivorous and herbivorous animals, thus fitting it for the mastication of the different foods, and placing us among the omnivorous animals.

In order that digestion may take place in a perfectly natural manner, it is necessary that the food, as it is received into the stomach, should be first properly macerated and thoroughly mixed with the fluids of the mouth, otherwise stomach digestion is much prolonged and difficult. Violations of this physiological law are a frequent cause of dyspepsia.

Persons losing their teeth, should not hesitate for any length of time, to replace them with artificial ones. Again referring to comparative anatomy, we know from it, that in animals swallowing their food without masticating, the stomach digestion is much more prolonged, than in the human subject, even when the diet is the same, the deduction of which is, that the proper mastication shortens the time of digestion.

3. *Insalivation.* This stage of digestion is accomplished, like the preceding, in the mouth, and simultaneously with mastication. This process consists of soaking and covering the food, bruised by the teeth, with a colorless and ropy liquid, the *saliva.*

The saliva is secreted in a great measure by three pairs of glands, forming an almost continuous series along the

lower jaw. These three glands are the *parotid* situated in front of each ear, the *sub-maxillary* glands, and the *sub-lingual* glands, concealed under the tongue. These three sets of glands, form what is commonly called "*salivary glands.*"

The amount of saliva secreted during twenty-four hours, in a healthy adult, who is not afflicted with the tobacco chewing habit, is a little less than three pounds, of which rather more than one-half is secreted during the intervals of eating. It should also be borne in mind, however, with reference to this and the other digestive secretions, that this immense amount of fluid is at no one time removed from the blood, but is reabsorbed nearly as fast as secreted, and that normally none of it is discharged from the organism. It is the removal of saliva from the system, incident to chewing tobacco, or other substances void of nutrition, that makes these practices injurious to health and disgusting to the surroundings.

The chemical analysis made by Profs. Bidder and Schmidt is considered to be a reliable one, and from it we learn that saliva is composed as follows:

Water	995.16	parts.
Epithelium	1.62	"
Soluble Organic Matter	1.34	"
Potassium, Phosphates of Soda, Lime and Magnesia	1.04	"
Chloride of Sodium	0.84	"
	1000.00	

The active principle of the saliva is the organic matter, which was named by Berzelius "Ptyaline," and Prof. Mealhe, describes it under the name of "animal diastase.' In the normal state, the reaction of saliva is alkaline.

The functions of saliva are both mechanical and chem ical. The first has for its object to assist the mastication and deglutition of alimentary matters, acting as a lubricant, and the second, under the influence of "ptyaline,"

transforms starchy foods into a saccharine and soluble substance, called "glucose." Of the rapidity of this action, any one can easily convince himself by the simple experiment of taking a little cooked starch into the mouth, mixing it well with the saliva and testing in the ordinary way for sugar.

The saccharine taste acquired by a piece of bread triturated for a certain time in the mouth is due to this chemical reaction.

It has been observed that the saliva has a remarkable tendency to entangle bubbles of air in the alimentary mass. In mastication a considerable quantity of air is mixed with the food, and this undoubtedly facilitates the penetration of the gastric juice. It is well known that moist, heavy bread, and articles that cannot become impregnated in this way with air, are not easily acted upon in the stomach.

4. *Deglutition* means swallowing, and is the act by which solid and liquid articles are forced from the mouth into the stomach. The process involves first the passage by a voluntary movement of the alimentary mass through the isthmus of the fauces into the pharynx; then a rapid contraction of the muscles of the pharynx, by which it is forced into the œsophagus; and finally, a peristaltic action of the muscular walls of the œsophagus, extending from its opening at the pharnyx to the stomach.

The first process is purely voluntary, while the other two are not, and beyond the control of the will.

The parts of the anatomy taking part in swallowing, are the *tongue*, the *pharynx* and the *œsophagus*.

The *tongue* is, as everybody knows, endowed with highly important functions connected with mastication, and is the chief agent in the first process of deglutition. When swallowing the tongue is hollowed in a gutter-like form, is elevated from the tip to the base, supported on the vault of the mouth, and it directs the macerated and

insalivated particles of food toward the isthmus of the gullet, over which they pass. At the same time the *pharynx* is elevated, seizes the food and incloses it in the *œsophagus*, where the muscular contractions of this tube carry the mass as far down as the stomach.

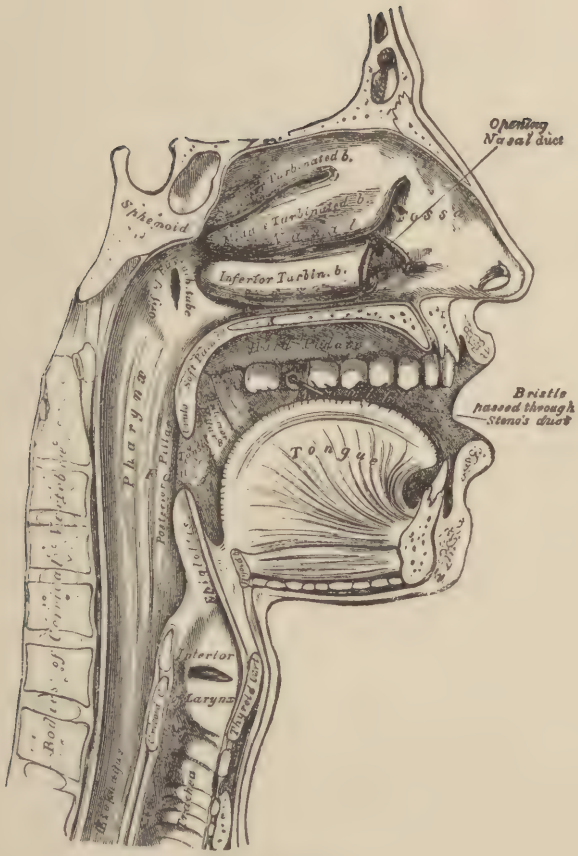
For a more graphic description of the different organs which assist in deglutition, the reader is referred to engraving No. 14, and the explanatory notes thereon.

The *œsophagus or gullet* is a muscular canal, about nine inches in length, extending from the pharynx to the stomach. It commences between the fifth and sixth cervical vertebræ, descends along the front of the spine, passes through the diaphragm, and entering the abdomen terminates at the cardiac opening of the stomach opposite the ninth dorsal vertebra. It is the narrowest part of the alimentary canal, being most contracted at its commencement, and at the point where it passes through the diaphragm.

During deglutition, speaking, laughing or ill managed inspiration are of much danger, for the reason that particles of food are liable to enter the windpipe. Such accidents excite paroxysms of suffocation, and may cause death. When swallowing is properly done, the act closes the epiglottis down upon the windpipe.

It is said that a grape stone caused the death of Anacreon, the great lyric poet of Greece, by penetrating into the larynx while he tried to enjoy the juicy fruit and laugh at the same time.

5. *Stomach Digestion* or *Chymification.* As soon as the masticated and insalivated food has been swallowed it arrives at the stomach, which is the most dilated portion of the alimentary canal. Its purpose is a double one, namely for a receptacle of food and an organ in which certain important digestive processes take place. It is situated in the upper left portion of the abdominal cavity and is held in place by folds of the œsophagus and the



Engraving No. 14.

Sectional view of the Nose, Mouth, Pharynx, Larynx, Trachea, and Œsophagus.

peritoneum. Its form is not so easily described; the article it resembles most is the bagpipe, and then only when moderately distended. When empty, its walls are collapsed and in many parts they come in contact with each other. Its holding capacity is about five pints. The stomach has two openings, the *œsophageal* from above, and the *pylorus*, which leads to the intestinal canal.

In structure, the stomach has three coats; they are, counting from without, the *peritoneal*, the *muscular* and the *mucous*. The first is similar to the peritoneum, as its name implies. The muscular coat presides over various motions of the stomach; in it are embedded the gastric nerves and bloodvessels. The mucous coat is doubtless the most interesting. The mucous membranes of the œsophagus and of the stomach are very different in character. The white, hard appearance of the œsophageal lining abruptly ceases, in the shape of a sharply defined dentated border, and the inner membrane of the stomach appears soft and velvety and of a reddish gray color. The mucous membrane of the stomach is loosely attached to the next tissue, and is thrown into long hardened folds, which become effaced when the organ becomes distended. The thickness of the mucous membrane varies in different parts measuring from $\frac{1}{32}$ to $\frac{1}{12}$ of an inch.

Throughout the entire extent of the mucous membrane of the stomach, *Gastric* or *Peptic Glands* are found, except around the pyloric orifice and in the right lower portion. These glands vary in length according to the variations in the thickness of the mucous membrane. The object of these *glands* is the secretion of a fluid called *Gastric juice*, through the chemical action of which, important modifications of the food take place.

Gastric Juice. The case of Alexis St. Martin, is undoubtedly the only instance on record, in which pure normal gastric juice has been obtained from the human subject, and as the circumstances connected with the case

are of much interest, a condensed history of the affair is herewith given:

"Alexis St. Martin, a Canadian voyageur in the service of the American Fur Company, eighteen years of age, of good constitution and perfectly healthy, was wounded in the left side by the accidental discharge of a gun loaded with buckshot. The wound was received on the 6th of June, 1822, and the muzzle of the gun was not more than a yard distant from the body. The contents of the gun entered posteriorly, carrying away integument and muscle from a space the size of the hand, with the anterior half of the sixth rib, lacerating the lower portion of the left lobe of the lung and diaphragm, and perforating the stomach. The patient was seen by Dr. Beaumont within half an hour after the accident, when the above facts were noted, and an opening into the stomach was discovered, large enough to admit the forefinger. Extensive sloughing took place, and for seventeen days everything that was swallowed passed out at the wound, and nourishment was administered through the rectum. In the spring of 1824, the wound had cicatrized and the patient had perfectly recovered his health; but in the process of cure, seven pieces of cartilage had come away and three or four inches of the sixth rib, and about half of the lower edge of the fifth rib, had been removed by an operation. The perforation into the stomach was irregularly round and about two and a half inches in circumference. This opening was closed by a protrusion of the mucous membrane of the stomach in the form of a valve, which could readily be depressed by the finger, so as to expose the interior of the organ. The valve effectually prevented the discharge of the contents of the stomach, which had annoyed the patient previous to the winter of 1823-1824.

"From May, 1825, until August of the same year, St. Martin was under the observation of Dr. Beaumont, and submitted to numerous experiments. At the end of that time, he returned to Canada, and was lost sight of for four years, during which time he married and became the father of two children, and worked hard to support his family, and enjoyed robust health and strength. After that he came again under the observation of Dr. Beaumont and continued with him in the capacity of a common servant, until March, 1831. After this he was under observation from time to time until 1836, all the time enjoying perfect health, with good digestion, and having become the father of several more children."

From this fistulous opening in the stomach of St. Martin, Dr. Beaumont withdrew gastric juice and ob-

served that its flow was greatly increased when alimentary substances were introduced into the stomach.

Dr. Beaumont also established the following facts: That gastric juice is one of the most sensitive fluids secreted by the system, and that eating or drinking to excess, emotions, anger, fear, diminished and sometimes entirely suppressed the secretion of it by the stomach. At such times the mucous membrane became red and dry, and at others it was pale and moist. Drinks were immediately absorbed, but food remained in the stomach undigested for twenty-four hours, and even forty-eight in some cases. Therefore, dear reader, take a lesson from the researches of this good scientist, and do not eat when you are under mental excitement of any kind. Food would probably decompose but not digest.

The stomach is no doubt the organ in which the most important part of the digestive process is inaugurated, inasmuch, as by its secretion, the gastric juice, the chemical modifications of the food take place.

Gastric juice is a clear, colorless or faintly amber colored fluid of watery consistency and acid reaction. Its specific gravity does not vary much from 1009.

The following is its chemical composition:

Water	973.062
Pepsin (ferment)	17.127
Free hydrochloric acid	3.050
Chloride of potassium	1.125
Chloride of sodium	2.507
Chloride of calcium	0.624
Chloride of ammonium	0.468
Phosphate of lime	1.729
Phosphate of magnesia	0.226
Phosphate of iron	0.082
	1000.00

One of the striking physical properties of the gastric juice is its acid reaction, by which it is distinguished from

all the other digestive secretions and internal fluids of the body. This property is dependent on the presence of "free hydrochloric acid." The other characteristic ingredient in the gastric juice is the ferment or pepsin, and it is to this that the peculiar digestive properties of the gastric juice are due. In reality, this juice is an acidulated solution of pepsin. The acid as well as the pepsin must be present in order that the secretion may exert its digestive power.

Gastric juice acts during stomachial digestion upon meat, free albumen, fibrin, casein and gelatine, and dissolves these articles so they cannot be recognized. Fat through the animal heat of the stomach becomes liquefied, but the oil globules pass out of the stomach into the intestines unchanged.

Sugar, bread (starchy portion) and salts are not influenced by the gastric juice.

It has been estimated by Professors Bidder and Schmidt that a healthy man secretes, during the period of twenty-four hours, approximately fourteen pounds of gastric juice. In this connection it must be borne in mind that after the fluid has performed its office in digestion, it is immediately reabsorbed and but a small quantity exists in the stomach at any one time, and might be summarized as follows: During digestion the stomach is continually producing out of the material furnished by the blood, gastric juice which liquefies certain elements of the food and as fast as this is accomplished is absorbed again by the blood, together with the principles that have been thus digested.

Duration of stomachial digestion is perhaps best shown by the table prepared by Dr. Beaumont, made from observations by him on St. Martin, and gives the relative digestibility of a number of alimentary substances, together with their mode of preparation.

ARTICLE OF DIET.	MODE OF PREPARATION	HR.	MIN.
Milk	Boiled	2	
"	Raw	2	15
Eggs, fresh	"	2	
" "	Whipped	1	30
" "	Roasted	2	15
" "	Soft boiled	3	
" "	Hard boiled	3	30
" "	Fried	3	30
Custard	Baked	2	45
Codfish, cured dry	Boiled	2	
Salmon Trout, fresh	Boiled	1	30
" " "	Fried	1	30
Bass, striped	Broiled	3	
Flounder	Fried	3	30
Catfish	"	3	30
Salmon, salted	Boiled	4	
Oysters	Raw	2	55
"	Roasted	3	15
"	Stewed	3	30
Venison Steak	Broiled	1	35
Pig, sucking	Roasted	2	30
Lamb, fresh	Broiled	2	30
Beef, fresh, lean, rare	Roasted	13	
Beefsteak	Broiled	3	
Beef, fresh, lean, dry	Roasted	3	30
" with mustard	Boiled	3	10
" with salt only	"	3	36
Beef	Fried	4	
Mutton, fresh	Broiled	3	
" "	Boiled	3	
" "	Roasted	3	15
Veal, fresh	Broiled	4	
" "	Fried	4	30
Pork Steak	Broiled	3	15
" fat and lean	Roasted	5	15
" recently salted	Raw	3	
" " "	Stewed	3	
" " "	Broiled	3	15
" " "	Fried	4	15
" " "	Boiled	4	30
Turkey, wild	Roasted	2	18
" domesticated	Boiled	2	25
" "	Roasted	2	30
Goose, wild	"	2	30
Chicken, full grown	Fricasseed	2	45
Fowls, domestic	Boiled	4	
" "	Roasted	4	
Duck, domesticated	"	4	
" wild	"	4	30

ARTICLE OF DIET.	MODE OF PREPARATION	HR.	MIN.
Soup, Barley	Boiled	1	30
" Bean	"	3	
" Chicken	"	3	
" Mutton	"	3	30
" Oyster	"	3	30
" Beef, with vegetables	"	4	
" Marrowbone	"	4	15
Pig's Feet, soused	"	1	
Tripe, soused	"	1	
Brains, Animal	"	1	45
Spinal Marrow	"	2	40
Liver, fresh Beef	Broiled	2	
Tendons	Boiled	5	30
Heart, Animal	Fried	4	
Cartilage	Boiled	4	15
Hash, Meat and Vegetable	Warmed	2	30
Sausage, fresh	Broiled	2	30
Gelatine	Boiled	2	30
Cheese, old, strong	Raw	3	30
Green Corn and Beans	Boiled	3	45
Beans, pod	"	2	30
Parsnips	"	2	30
Potatoes, Irish	Roasted	2	30
" "	Baked	2	30
" "	Boiled	3	30
Cabbage, head	Raw	2	30
" " with vinegar	"	2	
" "	Boiled	4	30
Carrots	"	3	13
Turnips	"	3	30
Beets	"	3	45
Bread, Corn	Baked	3	15
" Wheat, fresh	"	3	30
Apples, Sweet, mellow	Raw	1	30
" Sour "	"	2	
" " hard	"	2	50

We desire to invite special attention to the fact that the foregoing table only shows the duration of the process of chymification, that is the time intervening between the entrance of food into the stomach, and its passing out of the same through the pyloric orific. While many of the ingredients of the above mentioned articles of food become completely liquefied through the action of the gastric juice thereon, and are absorbed from the stomach by the system, a large percentage of the alimentary substance passes into

the intestine there to be further digested through the agency of other fluids, and then absorbed. It is a fact that intestinal digestion is on a par with that of the stomach and should not be under-estimated.

Various circumstances influence stomach digestion, and among these should be counted that gentle exercise, conjoined with repose or agreeable and tranquil occupation of the mind, is more favorable to digestion than absolute rest. Violent exercise or severe mental or physical exertion is always undesirable immediately after the ingestion of food, and will retard digestion. The proper thing is a short sleep of only a few minutes' duration, taken in a sitting posture.

The nervous system exercises an enormous influence over digestion, and this is specially marked when a person after a full meal, is affected by strong mental emotions.

When all the nutritive elements which can be separated through the aid of the gastric juice are withdrawn from the alimentary substance, the residue, such as liquefied fat, starch, sugar, etc., etc., passes along the digestive canal, through the pyloric orifice of the stomach, and enters the small intestine, there to undergo the process of chylification.

6. *Intestinal Digestion* or *Chylification.* The small intestine is a long cylindrical tube, occupying the greater part of the abdominal cavity. It must be regarded as one of the most important divisions of the digestive system and its anatomy, together with that of the liver and pancreas, which discharge their secretions into this tube, is indispensable for the proper comprehension of this stage of digestion. In this section we find the final elaboration of most of the alimentary principles, and how these are taken into the circulating fluid, either direct or through the functions of the lymphatic system.

The *mesentery* is a serous membrane, and holds by a double fold, the entire small intestines extending from the

stomach to the ilio-cæcal valve, or commencement of the large intestine, to the spinal column. As the *peritoneum*, which lines the cavity of the abdomen, passes from either side of the spinal column, it comes together in a double fold, just in front of the great bloodvessels along the spine, and passing forward splits again into two layers, which become continuous with each other, and inclose the intestine, forming its external coat. The width of the mesentery is usually from three to four inches, but at the commencement and termination of the small intestines becomes shorter, thus binding together the adjacent parts. While the mesentery keeps the intestine in place, it allows a certain amount of motion, so that the tube may become convoluted, accommodating itself to the size and form of the abdominal cavity.

To measure the length of the small intestines, owing to their distensible nature is very difficult, but it has been approximated that it is about twenty feet, while *in situ*. When separated from the mesentery and measured without stretching, its length has been found about five times that of the body. Its diameter is about one and a quarter inch.

While throughout the length of the small intestine no marked difference exists, the anatomical and physiological peculiarities are sufficient to warrant the division of the tube into three portions.

1. The *Duodenum*, so named that its length is about equal to twelve fingers' breadth, or from eight to ten inches. This part connects on one end with the stomach and is considerably wider than the constricted pyloric end of the stomach. It is also much wider than the next section.

2. The *Jejunum*, the second portion and continuation of the duodenum. It consists of the upper two-fifths of the small intestines.

3. The *Ileum*, in structure somewhat narrower and

thinner than the former, constitutes the remainder of the small intestines. It opens into the cæcum, or first section of the large intestine.

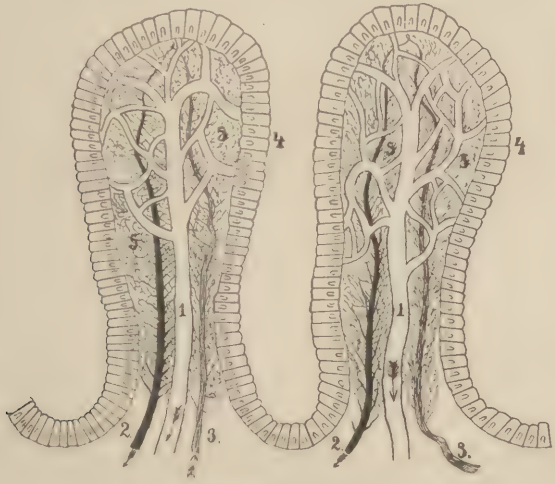
The mucous coat or inner lining of the small intestines, is somewhat thinner than the lining membrane of the stomach. It is thickest in the duodenum, and generally diminishes until the ileum is reached. This coat is highly vascular, presenting, like the stomach, a great increase in the quantity of blood during the process of digestion. In appearance it is soft and velvety, and of a red color during digestion, and pale pink when inactive.

The mucous membrane presents for examination the following structures contained within it:

Valvulæ Conniventes, or valves of Kerkring, are foldings of the mucous membrane and submucous tissue. Unlike the folds in the stomach, they are permanent, and are not obliterated when the intestine is distended. It is evident that the food, as it passes along in the intestinal tube in obedience to the peristaltic movements, must, by insinuating itself beneath the folds and passing over them, be exposed to a greater extent of mucous membrane than if these valves did not exist. This is about the only definite use of the valves that can be reasonably assigned to them.

Villi are minute, highly vascular processes projecting from the mucous membrane of the small intestine throughout its whole extent, and give to its internal surface the velvety appearance heretofore mentioned. They are largest and most numerous in the duodenum and jejunum, and become fewer and smaller in the ileum. Their number throughout the small intestine is somewhat incredible, it being estimated by Prof. Krause at about four millions, while another scientist, Professor Sappey of France, estimates their number as upward of ten millions. In form they are flattened cylinders or cones, measuring from one-thirtieth to one-twentieth inch in length, and from $\frac{1}{150}$ to $\frac{1}{70}$ in breadth at their base.

In structure the villi are simple elevations of the mucous membrane provided with bloodvessels and lacteals, or intestinal lymphatics. Externally is found a single layer of long columnar epithelial cells. To better comprehend this minute structure, a highly magnified engraving of a single villi is embodied in this paragraph, together with an index of the minute anatomy.



Engraving No. 15.

Two Villi, (Magnified.)

1. Lacteal.
2. Vein.
3. Artery.
4. Epithelium.
5. Capillaries.

The presence of lacteals in the villi is well established, but the question of their origin therein is a very obscure one. The offices of the lacteals, as well as the absorbing veins throughout the digestive tract, will be considered and elaborated upon under the chapter entitled, "Absorption."

The Simple Follicles or crypts of Lieberkuhn, are found in considerable numbers over every part of the mucous membrane of the small intestine. They secrete a fluid known as the *intestinal juice.*

The physiological action of intestinal juice, as secreted by the *simple follicles*, is that of transforming starch into

glucose, and as a fluid it aids the process of intestinal digestion.

The Duodenal or Brunner's Glands are confined to the duodenum and commencement of the jejunum. They also secrete a fluid which, however, has not been collected in sufficient quantity to establish its nature and purpose.

The Solitary and Peyer's Glands or Patches have one and the same structure, only differing that the former are isolated and the latter congregate in patches. These glands are usually found in the ileum and always opposite to the attachment of the mesentery.

These glands are also invested with bloodvessels and lacteals. The functions of these glands are not sufficiently demonstrated to warrant an assertion borne out by facts.

ACCESSORY ORGANS OF DIGESTION.

1. **The Pancreas,** which is a compound gland analogous in its structure to the salivary glands. Its name is derived from the Greek, signifying "all flesh." It is the same as what is known in ruminating animals as "sweet breads." The right extremity of the pancreas is curved upon itself from above downward, and is embraced by the cavity of the duodenum. It is situated transversely across the posterior wall of the abdomen behind the stomach. Its weight varies from two to four ounces, and sometimes as much as six. The anterior surface is covered by the peritoneum. This gland secretes a digestive fluid known as the *pancreatic juice*, the composition of which is approximately as follows in 1000 parts :

Water	900
Organic matters, precipitable by alcohol and containing a little lime. (Also known as pancreatin)	90
Carbonate of Soda Chloride of Sodium	10

Chloride of Potassium	10
Phosphate of Lime	
	1000

Its specific gravity is 1040.

Pancreatin and *trypsine* are the essential physiological constituents of the pancreatic juice, giving this fluid its peculiar digestive properties. Although the fluid itself is alkaline, it retains its physiological properties when it has been rendered acid by the admixture with gastric juice.

The action of pancreatic juice in digestion is of great importance in the digestion of nearly all the alimentary principles as they pass out from the stomach. It is the only one of the digestive fluids which is capable of forming a complete and permanent emulsion with fats, and thus makes this important article of food assimilable and capable of absorption into the blood current.

The property of converting the starchy elements of food is possessed by several of the digestive fluids. Under the consideration of saliva we have stated that it is capable of similar virtues, but this transformation is arrested when the food enters the stomach. When, however, the starchy elements reach the small intestine, its digestion is completed by the pancreatic juice.

Pancreatic juice in conjunction with intestinal juice also effects the transformation of sugar into glucose.

Lastly it takes hold of the undigested albuminous substances which may have escaped transformation during stomach digestion, and prepares them for absorption.

The Pancreatic Duct extends from left to right transversely through the substance of the pancreas, leaving the right extremity of the gland, descending slightly and forms a connection with the common bile duct, which in turn descends and enters the duodenum about at its middle. It is thus that this important fluid enters into the digestive tract and fulfills its functions.

2. **The Liver** is a glandular organ of large size intended mainly for the secretion of the bile, but effecting also important changes in certain constituents of the blood in their passage through it, a matter which will be considered under the functions of this organ. It is situated in the right side, what is known as the *right epigastric* and *hypochondriac* regions, and just below the diaphragm. When moderately filled with blood it weighs about four and a half pounds, and in persons of average adipose development its proportion to the weight of the body is about as one to thirty-two.

The liver has five ligaments, four of which are formed by folds of the peritoneum, and the fifth, the round ligament, results from the obliteration of the umbilical vein. These ligaments, together with the bloodvessels entering and leaving the same, hold the liver in place.

For general descriptive purpose it suffices to say that the liver is divided into the right, by far the greatest, and the left lobe; in a closer study it would be divided into five, *i. e.*, right, left, square, Spigeli and tail lobes.

The substance of the liver is made up of innumerable lobules of irregular form, about $\frac{1}{30}$ of an inch in diameter. The space which separates these lobules is about $\frac{1}{100}$ of an inch thick, and is occupied by the bloodvessels, nerves and ramifications of the hepatic duct, all inclosed in a fibrous sheath.

The Hepatic Artery arises from the abdominal aorta and carries arterial blood to the substance of the liver.

The Portal Vein and its tributaries; being the *splenic* vein from the spleen, the *gastric* vein from the stomach, the upper and lower *mesenteric* veins from the intestines, collecting blood from the organs mentioned, unite in the portal, which then delivers the mass of venous blood into this gland.

The Gall Bladder is the reservoir for the bile and situated on the under surface of the right lobe of the

liver, and is a conical, pear shaped membranous sac, about four inches in length and one in diameter, holding from eight to ten drachms of bile.

The Bile Ducts are three in number:

1. *The hepatic* or liver duct is formed of two trunks of nearly equal size within the substance of the liver and issues therefrom to join (2) the *cystic* duct which passes downward to the left of the neck of the gall bladder to form the (3) *common duct*, which is the excretory duct of both the liver and gall bladder. It is about three inches in length, and its diameter is about equal to that of a goose quill. In its descent, near its termination it is joined by the pancreatic duct and thus enters the duodenum. Cases are however on record where the common duct and pancreatic duct had separate entrances into the duodenum.

The Bile as secreted by the liver, and as it comes from that organ, is a somewhat ropy fluid, which viscidity is increased after its storage in the gall bladder. Its color varies according to the state of health and may be anything between yellowish green to a reddish brown. It is semi-transparent in a healthy being. In the carnivora it is dark green, and in the herbivora yellowish green. The human in his nature of an omnivera, takes the middle between these two colors. The specific gravity varies between 1020 to 1025. In the fresh state it is inodorous but undergoes putrefaction readily from contact with air and assumes a sickening odor. The taste is bitter owing to the many mineral salts it contains.

In chemical composition bile is as follows:

Water	916
Organic matters, such as Choleate of Soda (giving the bile its alkaline reaction), Cholesterine, Biliverdine (the pigment from which bile has its color), Lecithene, and Fat	75
Mineral Salts	9
	1000

The functions of the liver and its secretions may be summed up as follows:

1. The formation of *glycogen* (a substance resembling starch and transformable into sugar), which contributes to the maintenance of animal heat and to the nutrition of the blood and tissues, and the development of white blood corpuscles.

2. The destructive change of albuminoid matter, and the formation of urea and other nitrogenous products, which are subsequently eliminated by the kidneys, these chemical changes also contributing to the development of animal heat.

3. The secretion of bile, the greater part of which is re-absorbed, assisting in the assimilation of fat and peptones, and probably in those chemical changes which go on in the liver and portal circulation, while part is excrementitious, and in passing along the bowel, stimulates *peristaltic* movement and arrests decomposition.

Thus we must recognize that the liver is the store-house of our fuel food, in the form of glycogen. This is converted into sugar, as is required for the wants of the organism by a ferment in the liver itself. It is the same process as in the plant. The plant digests its stored starch as it requires, by first converting it into sugar. The liver takes from its store glycogen as it requires for the wants of the body. By such means a regular supply of sugar is furnished to the blood.

As to the second function of the liver, much has to be learned. Its action can be recognized in the destruction of waste and surplus albuminoids; we see that urea is formed by the liver, not by the kidneys. The liver is probably also, a filter allowing certain nutritive matters to pass onward, while arresting other matters whose presence in the blood is deleterious, as for instance, preventing the digestive ferments from reaching the general circulation, when these fluids if they reached there, would in all prob-

ability be distinctly harmful, by disintegrating the blood-vessels themselves. From experiments made by Dr. Schmidt-Muehlheim and others, it has become evident that the normal products of digestion are poisons of no inconsiderable power, and if they reach the general circulation in large quantities they may produce very alarming, if not dangerous symptoms. Hence, it appears that in certain conditions, as a consequence of disturbance in the working of the liver, the organ is not only ill-fed from the absence of normal products of assimilation, but is actually poisoned by the presence of products which are positively harmful.

The Spleen is counted among the accessory organs of digestion, however not by right of established knowledge. It is a ductless gland, having no excretory ducts, which would lead any products, if it had them, to other parts. The spleen is located in the *left hypochondriac* region, next to the cardiac extremity of the stomach. Its color is a dark bluish red, soft and friable in consistence. In shape it resembles the tongue of a dog. Its length is about five inches, and nearly four inches in width, and about one inch in thickness. It weighs between six and seven ounces.

It must be of importance in some way to life, notwithstanding the fact that people are in existence, in whom this gland has been extirpated. The theories advanced as to what the functions are, vanish like soap bubbles when they are pricked. The human mind must rest upon the subject, with the thought that it must be in the body for some purpose, because the Divine architect of the soul's abode, made it a component part.

By the contractions of the muscular coat of the small intestine, the alimentary mass is made to pass along the canal, sometimes in one and sometimes in another

direction, the general tendency however, being toward the *cæcum*. The partially digested matters which pass out of the stomach are prevented from returning to it, by the peculiar arrangement of the fibers which constitute the pyloric muscle. When the food is once in the intestine, it is propelled along the canal by peculiar movements, which have been called *peristaltic*, when its direction is towa d the intestine. These movements are stimulated and excited by the passage of food from the stomach.

During the movements of the alimentary mass, through the digestive tract, digestion continues to take place aided by the different fluids before named, and separates those elements in the food which are destined to serve in the recuperation of the blood. Digestion is perhaps strongest in the stomach, next the duodenum, jejunum, and diminishes in the ileum. Absorption takes place throughout the alimentary canal.

7. *Functions of the Large Intestine.* The large intestine, so-called because its diameter is greater than that of the rest of the intestinal tract, receives for the most part only the indigestible residue of the food, mingled with certain of the secretions, which are discharged into the small intestine. In the human subject, the processes of digestion which take place in this part of the alimentary canal are unimportant, and it is probable that hardly anything but liquid is absorbed by its lining membrane. Matters are however, stored up in the large intestine for a number of hours, and a certain amount of secretion takes place.

The entire length of the large intestine is from four to six feet. Its diameter is greatest at its commencement, where it measures, when moderately distended, from two and a half to three and a half inches. Passing from the cæcum, the canal diminishes in caliber gradually and very slightly, to where the sigmoid flexure opens into the rectum. Beyond this the rectum gradually increases in

diameter, forming a kind of pouch, which abruptly diminishes in size near the external opening, to form the anus the final termination of the alimentary canal, the commencement of which is the mouth.

The general direction of the large intestine is from the cæcum in the right iliac region to the left iliac, thus encircling the convoluted mass formed by the small intestine, in the approximate form of a horseshoe. The first section is called the *cæcum* or blind intestine, and from there to the commencement of the rectum it is named the *colon*. This latter part is subdivided into the following sections: (1) The *ascending colon* passes up in the right iliac region to the under surface of the liver, where the intestine turns nearly at right angle and traverses the abdomen in the upper part. This section is called (2) the *transverse colon*. The colon then passes down, forming again a right angle and this section is called the *descending colon* (3). The last division is the (4) *sigmoid flexure*, and is situated in the lower left portion of the abdomen. In form it resembles somewhat the Roman letter "S." The flexure terminates in the (5) *rectum*. Its name would imply that it was straight, which it is not, as it curves in its descent.

The *cæcum*, or cul-de-sac as the French call it, presents a rounded, dilated cavity, continuous with the colon above, and communicating with a transverse slit with the ileum. At the lower portion of the cæcum is a small cylindrical tube, from one to five inches in length, called the *appendix vermiformis*. The uses of this appendix are unknown.

The most interesting anatomical peculiarity of the cæcum is the opening by which it receives the contents of the small intestine.

This opening is arranged in the shape of a valve, known as the *ileo-cæcal* valve, and situated in the inner portion of the cæcum. This valve prevents the return of the alimentary mass, after it once enters into the large intestine, into the ileum.

The alimentary mass as it enters the large intestine is nearly void of nutrient substances, and become *fæces* or matter to be eliminated. This excrement moves first up in the colon, then traverses and descends into the sigmoid flexure, which is a place of accumulation. At certain tolerably regular intervals the fæcal matter is passed into the rectum and then almost immediately discharged from the body. Under normal conditions the rectum is nearly always found empty and contracted.

In health, expulsion of fæcal matter takes place with regularity once in every twenty-four hours. This rule is, however, very variable, and evacuations may occur twice or three times a day, and then only again every other day, and still are regarded within the limits of health.

The condition which immediately precedes the desire for defæcation is probably the descent of the contents of the sigmoid flexure of the colon into the rectum.

The foregoing pages describe the anatomical apparatus used in digestion and also the many physiological actions, which come into play during the process of it.

The writer feels safe in asserting that the majority of diseases can be traced to the disarrangement of the digestive functions, and if the reader joins him in this theory, it must be evident that in order to trace the origin of the numerous ailments human flesh is heir to, the normal state must be well understood. To assist in forming as comprehensive an idea of the wonderful machinery of digestion, we have at much labor and expense prepared a plate (No. 11), which shows not only how food is transferred into blood, the object of digestion, but also how these blood building substances are incorporated into the blood mass throughout the vascular system. It also gives the topography of the organs of respiration, the functions by which the blood becomes nutrient, and that portion which was used once is again rejuvenated.

We cannot urge the reader too much to study this

plate, and thus become familiar with the names of the different organs portrayed thereon, their location and relative functions.

It is an object lesson, which shows at a glance the machinery participating in the conversion of food into blood, together with how it is delivered into the general circulation as described in the next chapter.

CHAPTER VII.

ABSORPTION.

Digestion has two great objects; one is to liquefy the different alimentary principles; and the other, the transformations by which these principles are rendered capable of nourishing the organism.

The aliments thus acted upon are taken into the blood as fast as the requisite changes in their constitution are effected, and when once received into the circulation, they become part of the great nutritive fluid, supplying the waste which the constant generation of the tissues from materials furnished by the blood necessarily involves. The only exception to this rule is the fat. A small portion of this may be passed directly into the blood-vessels; the greater mass of it, however, finds its way into the circulation by means of special absorbent vessels, which empty into large veins. Fat enters the blood in the condition of a fine emulsion.

The process by which the digested materials are taken into the blood is *absorption*, in which two sets of vessels are engaged, namely, the bloodvessels and the lacteals.

Such parts of the food as have been rendered fluid, and are capable of forming a homogeneous mixture with the blood are absorbed by the bloodvessels. Fat after a proper reduction to an emulsion is taken up by the lacteals.

Absorption by the Bloodvessels. It is an established fact that soluble substances can pass through the

delicate walls of the capillaries and small veins, and that absorption actually takes place in the great part by the bloodvessels of the alimentary canal.

The time occupied for the food to pass through the mouth and gullet is so brief and the chemical changes it undergoes so slight, that the absorption taking place in these organs can hardly be taken into consideration. It might be proper, however, in this connection, to guard smokers not to harbor within the cavity of the mouth the smoke of the tobacco, as the condensations in the form of nicotine is taken into the system and to the injury thereof. The same things hold good in the case of the chewers of tobacco, inasmuch as some of the poisons freed during mastication of the weed find their way into the circulation, by way of absorption, through the mucous membrane.

The stomach is practically the first organ of absorption, and there it takes place with great activity, as accomplished by the bloodvessels. The amount of secretions eliminated by the mucous membrane makes the stomach an organ highly vascular, and with its absorbing quality is naturally increased.

All those principles of food which are dissolved by the gastric juice are converted into albuminose, as well as ingested liquids, and taken up directly by the bloodvessels of the stomach. As a general law it may be safely assumed that digested matters are in a great part absorbed as soon as their transformations in the alimentary canal have been accomplished.

As the food passes down the intestinal canal the mass becomes less, owing to the transfer of the nutrient parts of the circulation.

For instance, as the digestion of the albuminoids is completed, and they are absorbed, the blood becomes so much richer in that constituent, and so on with sugar and the fatty emulsions.

The greatest part of the food is absorbed by the intes-

tinal mucous membrane, and with the alimentary substances proper a large quantity of secreted fluid is reabsorbed. In the intestines it will be remembered that an immense absorbing surface is provided by the arrangement of the mucous membrane into folds, forming the valvulæ conniventes, and by the presence of the innumerable villi, which are found throughout the small intestines.

The bloodvessels performing these important functions of absorption are the capillaries and minute veins, which after uniting with numerous small stems form the gastric, upper and lower mesenteric veins, which again unite, and with the splenic vein form the portal. The latter conducts all these collections of blood from the viscera of digestion to the liver, there to undergo such process as has been already described.

Absorption by the Lacteals. One of the products of intestinal digestion is a white, opaque milky fluid of a slightly alkaline taste, and of a peculiar odor. It is known under the name *chyle*. While this product of digestion, in which nearly all the fatty substances have been incorporated, passes through the alimentary canal, it necessarily comes into contact with the villi, described under the chapter of digestion. Within these villi are located the lacteals, which imbibe in the chyle and transfer it outside the alimentary canal to the mesenteric glands embedded within the substance of the mesentery. Myriads of minute tubular vessels then carry the chyle to a place known as the chyle receptacle (*receptaculum chyli*), which forms the lower part of the thoracic duct.

The Thoracic Duct conveys the great mass of lymph and chyle into the blood. It is the common trunk of all the absorbing vessels (veins excepted) of the body. It commences in the abdomen by a triangular dilatation, the receptacle, which is situated in front of the second lumbar vertebra. It ascends along the spinal column to the left of the œsophagus. Opposite the seventh cervical

vertebra it inclines toward the left, forming an arch, and terminates near the junction of the left jugular and the subclavian veins.

Absorption of the Lymphatics. Even when the digestive system for want of proper food furnished to it, ceases to deliver to the circulation material for the rejuvenation of the blood, the body continues to exist for a time by withdrawing from the adipose tissue, muscles and other parts, a substance which owing to its watery appearance is called Lymph (*lympha*, water). The last mentioned matter is collected throughout the body (hair, nails, teeth, and cartilages excepted) by the lymphatic glands and vessels. The latter communicate either with the thoracic duct or with other parts of the venous system, and thus the great nutritive fluid, the blood, draws upon the stored resources of the body when food is not furnished in sufficient quantity or proper quality. Of course this living of the body upon itself cannot be continued indefinitely, but only so far in extreme cases till the body has lost forty per cent. of its weight. After that it is not capable of relinquishing sustenance for itself and dissolution would be a natural consequence.

By the absorption through the lymphatic vessels of the adipose tissue, etc., stored within hibernating animals such as the raccoon, bear, badger, woodchuck, etc., etc., during feeding season these creatures are enabled to subsist upon themselves during the long winter sleep. While they awake in a weakened condition from their slumber their well rested digestive organs set at once to work to lay by another supply for next season's sleep.

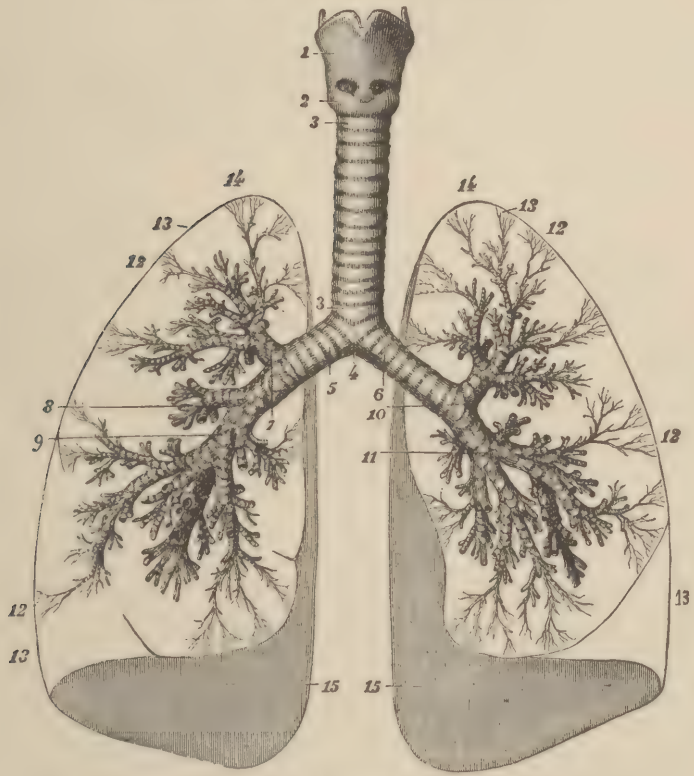
Many overfed persons should draw a lesson from this and give their digestive apparatus a long needed rest.

Absorption from without also takes place in the form of liquid through the skin and the mucous membrane of the air passages will absorb vapors, medicated for the relief of disease and poisonous gases often to the detri-

ment of the whole system, as is often witnessed in white lead works or in the mines where cinnabar is excavated, as well as in the reduction works of this ore where the mercury is extracted from it.

CHAPTER VIII.

RESPIRATION—VOICE.



Engraving No. 16. Trachea and Bronchial Tubes.

1. Larynx.
2. Larynx.
3. Trachea.
4. Bifurcation of Trachea.
5. Right Bronchus.
6. Left Bronchus.
7. Bronchial division.
8. Bronchial divivsion.
9. Bronchial division.
10. Bronchial division.
11. Bronchial division.
12. Ultimate ramification of the Bronchi
13. Lungs.
14. Summit of Lungs.
15. Base of Lungs.

The different organs participating in the respiratory apparatus are the nose, mouth (which will be described under the organs of sense), larnyx, trachea, bronchi and the lungs.

The Larnyx besides being the upper part of the air passage, is the organ of voice. It is situated between the trachea and the base of the tongue at the upper part of the neck where it forms a considerable projection in the middle line. In persons of average adipose this projection can be plainly seen, or at least felt, and is known by the name of "Adam's apple." The larynx is of a cartilaginous structure, narrow and cylindrical below but broad above where it presents the form of a triangular box flattened behind and at the sides, whilst in front it is bounded by a vertical ridge.

At the posterior upper opening of the respiratory passage and forming part of the larynx, is a trapdoor-like cartilage, known as the *Epiglottis*, which is always vertically upward during respiration, but closes down on the opening as soon as food passes from the mouth to the œsophagus, thus preventing the entrance of particles of alimentary matter into the respiratory passages.

It is the interior of the larynx which is of much interest, as there are located the mystic instruments of phonation.

The Vocal Chords. There are two pairs of these, the upper or false chords, so called because they are not directly concerned in the production of voice. The false chords consist of two folds of mucous membrane inclosing a delicate fibrous narrow band, called the superior *thyro-arytenoid* ligament. These chords are alro called *ventricular bands.*

The *lower* or *true Vocal Chords* are the ones directly concerned in the production of sound, and consist of two strong fibrous bands covered on their surface by a thin layer of mucous membrane. Each chord consists of a

band of yellow elastic tissue attached in front to the depressions of the wings of the larynx, and behind to the anterior angle of the back part. Thus the upper portion of the larynx, with the two true vocal chords as the base, and the free edge of the false chords, forms the *ventricle* of the *larynx*.

Eight pairs of minute muscles are connected with the internal larynx, of which number five pertain to the vocal chords and rim of the glottis, while the remaining three are connected with the epiglottis, executing the movements incident to the opening and closing of this organ. Those muscles connected with the vocal chords regulate the degree of tension.

The mucous membrane of the larynx is continuous above with that lining the mouth and pharynx, and is prolonged through the trachea and bronchi into the lungs. The membrane of the larynx is supplied with numerous small glands, the openings of which are found in nearly every part, and especially numerous upon the epiglottis. From these glands the air passage receives its moisture. No glands are however, found upon the vocal chords.

The Trachea or Windpipe is a cartilaginous and membranous cylindrical tube somewhat flattened behind, and extends from the lower part of the larynx on a level with the sixth cervical vertebra down to about opposite the fourth or fifth dorsal vertebra. Its total length is about four and a half inches, and the diameter varies from three-quarters to one inch in different persons. The trachea of the male is always of a greater diameter than that of the female. The cartilages of the trachea vary from sixteen to twenty in number; each forms an imperfect ring which surrounds about two-thirds of the cylinder of the trachea, being imperfect behind where the tube is completed by a fibrous membrane.

At its lowest extremity the trachea bifurcates and forms into the two *Bronchi*, one for each lung.

The Right Bronchus, wider, shorter, and more horizontal in direction than the left, is about an inch in length and enters the right lung opposite the fifth dorsal vertebra. The right pulmonary artery lies below and then in front of it.

The Left Bronchus is smaller, more oblique, and longer than the right, being nearly two inches in length. It enters the root of the left lung opposite the sixth dorsal vertebra, about an inch lower than the right bronchus. It passes beneath the arch of the aorta, crosses in front of the œsophagus, the thoracic duct and the descending aorta, and has the left pulmonary artery lying at first above and then in front of it.

The glands of the trachea and bronchi are found in great abundance at the posterior part, and their secretions serve to lubricate the inner surface.

The operations known as *Laryngotomy* and *Tracheotomy*, so often read about in public prints, are performed in the parts just described, namely, in the larynx and trachea respectively.

The Lungs. Each lung is invested upon its external surface by an exceedingly delicate serous membrane, the *Pleura*, which incloses the lung as far as the root, and then reflects upon the inner surface of the thorax. Each pleura is therefore a short sac, one occupying the right and the other the left half of the thorax. The inner surface of the pleura is smooth, and moistened by a serous fluid which serves as a lubricant in the respiratory movements of the lungs.

The two lungs are the essential organs of respiration, one in each of the lateral cavities of the chest, and separated from each other by the heart. Each lung is divided into lobes, the right into three, and the left into two. The right lung is the larger and heavier. For a more definite description of the lungs, the reader is referred to plate No. 11, on which these organs are truly portrayed (after

nature). The weight of the left lung is about twenty ounces, and of the right in the neighborhood of twenty-two ounces.

The color of the lungs at birth is a pinkish white; in adult life a dark slate color, mottled in patches, and as age advances this mottling assumes a black color. This coloring matter consists of carbonaceous substances deposited in the areolar tissue near the surface of the lungs.

The substance of the lungs is of a light, porous, spongy texture, floats in water, and is highly elastic.

In structure, the lungs are composed of an external serous coat, a subserous areolar tissue, and the pulmonary substance or parenchyma. The latter is composed of lobules, which, although closely connected with each other, are quite distinct by themselves. Each lobule is composed of one of the ramifications of the bronchial tube and its terminal air cells, and of the ramifications of the pulmonary bloodvessels, lymphatics and nerves, all of these structures being connected together by a fibrous tissue.

The bronchus upon entering the substance of the lungs divides and subdivides throughout the entire organ, thus permeating the whole of it.

The air cells are small acrolar recesses, separated from each other by thin partitions, and communicating freely with the air sacs. Their diameter varies from $\frac{1}{150}$ to $\frac{1}{70}$ of an inch.

The Pulmonary Artery conveys the venous blood to the lungs; it divides into branches which accompany the bronchial tubes, and terminates in a dense capillary network upon the walls of the inter-cellular passages and air cells. From this network the radicles of the pulmonary veins arise; coalescing into larger branches, they accompany the arteries and return the blood purified by its passage through the capillaries to the left auricle of the heart. In the lungs the branches of the pulmonary artery are usually above and in front of a bronchial tube, the vein below.

The pulmonary capillaries, where the change of venous blood into arterial takes place, form networks which lie immediately beneath the mucous membrane, in the walls and partitions of the air cells. The capillaries form a very minute network, the meshes of which are smaller than the vessels themselves.

The *Thyroid Glands* are situated at the upper part of the windpipe, one on each side. While they have no connection whatever with the function of respiration, they are usually mentioned in connection therewith, owing to their close proximity. The function of these glands is unknown.

The *Thymus Gland* is situated in front of the trachea, a little behind the sternum and rests upon the pericardium. It is a temporary organ only, attaining its full size at the end of the second year, when it ceases to grow, and gradually dwindles until at puberty it has almost disappeared. Its offices, like the former, are unknown.

In considering generally the functions of respiration, it is but proper to draw attention to the fact that the character of the blood are not identical in the three divisions of the vascular system—arteries, capillaries, veins. The researchers for facts in this respect have eminently well succeeded in the investigation which establishes the difference between arterial and venous blood, but as to blood from the capillaries, owing to the difficulty of obtaining a sufficient supply, it has been impossible to establish its characteristics.

While the arterial blood passes through the capillaries, it deposits from its substance the nutrients required for the tissues, and takes up the decayed matter. Thus modified, the blood enters the veins again and is venous in its character. Hence the only office of the veins is to carry the blood to the right side of the heart, from there to be

propelled into the lungs, where it loses the vitiating material it has collected in the tissues, takes in a fresh supply of oxygen, and then returns to the left side of the heart, revivified and prepared for furthur nutrition.

The important principles which are given off by the lungs are taken from the blood, and the oxygen which disappears from the air is absorbed by the blood, and mainly by the corpuscles therein.

To animal life oxygen is indispensable under all circumstances, but this gas is also required for the comparatively mechanical process of circulation. Of equal necessity is the elimination from the system of the carbonic acid, which the blood acquires in the tissues.

In view of these old established laws of nature, respiration may be defined as the process by which the various tissues and organs receive and appropriate oxygen, and give up and expel carbonic acid. This change of gases is accomplished through the current of blood, as it comes alternately in contact with air and the tissues.

Respiration is divided into two distinct acts, namely, inspiration and expiration; with the former life begins, and with the latter it ends.

Inspiration is accomplished by the elevation of the walls of the chest and flattening of the diaphragm. A muscular action, explained under the chapter on muscles.

Through this elevation a vacuum is formed within the lungs, causing the entrance of air.

Expiration is the expulsion of air from the lungs accomplished by a simple and comparatively passive process, namely, the collapse of the air cells and the contraction of the muscles surrounding the chest.

It will thus be seen, that the respiratory movements are due to the elasticity of the lungs and the expansion and contraction of the muscles surrounding the thoracic cavity.

There are different types of respiration:

1. The *Abdominal Type*. In which the diaphragm and the movement of the abdomen are most prominent. This type is mostly seen in children, irrespective of sex.

2. The *Inferior Costal Type*, in which the lower part of the thorax, from the seventh rib down, is most prominent.

3. The *Superior Costal Type* is the one where the muscles dilate the thorax above the seventh rib, as is so frequently seen in women, when wearing low cut dresses, and under emotional excitement.

As will be seen from the following statement, the respiratory acts vary much with age, and correspond proportionately with the frequency of pulse. The observations were made by Prof. Quetelet, and are the average from 300 different persons.

	PER MINUTE.
At birth	44 respirations.
At the age of five years	26 "
" " fifteen to twenty years	20 "
" " twenty to twenty-five yrs.	19 "
" " thirty years	16 "
" " fifty years	18 "

During sleep the respiration is reduced about twenty per cent.

Coughing and Sneezing are generally involuntary acts, produced by irritation of the air tubes or nasal passage. Coughing can however, be voluntary. Foreign bodies in the air tubes are often expelled by violent coughing.

Sighing is a prolonged and deep inspiration followed by audible expiration. Its purpose is to change the air in the lungs more completely.

Yawning is analogous to the former, and an involuntary act. It is presumed to be a sign of fatigue, but is also produced by contagion, or through tiresome rehearsals in company.

Laughing and Sobbing while expressing different conditions, are produced by the same mechanism. The characteristic sounds produced during these acts, are the

result of the short, rapid movement of the diaphragm, accompanied by the contractions of the face muscles, which express the signs of hilarity or grief.

Hiccough is produced by a sudden convulsive and involuntary contraction of the diaphragm, accompanied by a spasmodic contraction of the glottis. The causes for this disagreeable action are due mainly to the rapid ingestion of a quantity of dry food, or of effervescing or alcoholic drinks. It occurs quite often in disease.

Capacity of Lungs. The volume of air usually contained in the lungs, is about two hundred cubic inches. This air does not change at every respiratory act; a certain portion cannot be expelled by forced expiration. This amounts to about 100 cubic inches. In ordinary respiration the above mentioned amount of 200 cubic inches is always in the lungs, to which is added approximately twenty cubic inches at each inspiration, and a little less quantity of vitiated air is given off during expiration.

In some cases, however, as in blowing or the expression of long sentences recourse is had to inflate the lungs to their utmost capacity with air, which amounts to about 300 cubic inches in all. When 100 inches of this have been expelled, new inspirations are necessary.

CHANGES EFFECTED DURING RESPIRATION IN AIR AND BLOOD.

It was not known to the ancients, of what gases air was composed, and as the air which entered the lungs was always cooler than the expired air, their conclusion was, that the function of respiration was the cooling of the blood.

Air. Pure atmospheric air is a mixture of 79 parts of nitrogen and 21 parts of oxygen, with the addition of a very small quantity of carbonic acid. Floating in the air are a number of excessively minute organic bodies, also various odorous and other gaseous matters may be

accidentally present and form a constituent part. In respiration however, nitrogen and oxygen are only of importance. Good air for breathing should consist of four parts of nitrogen and one of oxygen and of a density as the Lord has provided upon the surface of the earth. When the air is very dense, as in mines, respiration is more or less difficult. High mountains are surrounded by air which is more rarefied, hence, respiration is increased in order to obtain the all important oxygen. We must inhale sufficient air to furnish our bodies at an average from 1200 to 1500 cubic inches of oxygen per hour. This amount is necessary to revivify the blood in our circulation.

When this air which contains the requisite amount of oxygen passes through the lungs, besides losing a proportion of the oxygen, it undergoes the following changes:

1. Increase of temperature.
2. Gain of carbonic acid.
3. Gain of watery vapor.
4. Gain of organic matter.
5. Gain and loss of nitrogen.

The first you can determine by experimenting upon yourself with a thermometer. The carbonic acid is formed in the destruction of the tissues, and carried by the veins to the lungs to be exhaled.

The other changes are productions of the tissues and blood to be eliminated.

The Oxygen which disappears from the air in the lungs is taken up by the blood in the pulmonary capillaries, there to be absorbed by the red corpuscles.

The color of the blood depends upon the presence or absence of oxygen and not on that of carbonic acid. The loss of oxygen from the arterial blood in the capillaries of the general circulation is due to its transfer from the corpuscles to the tissues. Tissues have a greater absorbing capacity for oxygen, than the corpuscles themselves, hence give up this gas, when they come in contact.

Of the oxygen brought into the lungs only about one-fourth is retained. The amount of carbonic acid exhaled is rather smaller than the volume of oxygen absorbed.

The carbonic acid exhaled by animal respiration tends to vitiate the air, and when the atmosphere contains more than $\frac{3}{10}$ of this gas, respiration is altogether impeded. Air is already positively unhealthy before this limit is reached.

Asphyxia is the result when the oxygen supply is cut off from the lungs, as is seen in suffocation, drowning, or the inhalation of air having not a proper proportion of oxygen in it.

The Larynx, in addition to its function in respiration, is the special organ for the production of vocal sounds.

Voice is only formed in expiration, never in inspiration. The column of outgoing air is set in vibration by the glottis, and its resonance modified in the pharynx, mouth and nasal passages. Through the tension and approximation of the vocal chords, the orifice of the glottis is narrowed to a comparatively minute crevice. When the vocal chords are relaxed during expiration, nothing can be heard but a faint whisper of the air passing through the larynx. In the production of a vocal sound the chords are made tense and closely applied to each other; and the air, driven by forcible expiration through the narrowed chink of the glottis, between the vibrating vocal chords, is itself thrown into sonorous vibration. The tone, pitch and intensity of the sound vary with the conformation of the larynx, the tension and approximation of the vocal chords, and the force of expiration.

The narrower the opening and the greater the tension of the chords, the more acute the sound; while a wider opening and a lower tension produce a graver note. The quality of the sound is also modified by the length of the column of air between the glottis and the mouth, the tense

or relaxed condition of the pharynx and fauces, and the dryness or moisture of the mucous membrane.

The production of a vocal sound takes place, therefore, in the larynx; while division of the sound into vowels and consonants, words and phrases, is accomplished by the lips, tongue, teeth and palate.

CHAPTER IX.

THE URINARY ORGANS.

Of these organs, the kidneys are of the utmost importance.

The Kidneys, two in number, are situated in the back part of the abdomen. They are placed in the loins, one on each side of the vertebral column, behind the peritoneum, and usually surrounded by a mass of fat. Their upper extremity is on a level with the upper border of the twelfth dorsal vertebra; their lower extremity on a level with the third lumbar vertebra. In form the kidney resembles a bean. Their length is about four inches, two and a half in breadth, and a little more than one inch in thickness. Their weight varies between four and a half and six ounces each. The combined weight of the two kidneys in proportion to the body is about as 1 to 240.

Each kidney is connected by means of a tube with the bladder; these conductors are called the *Ureters*, and are from sixteen to eighteen inches in length, and have the diameter of a goose quill.

The Bladder is the reservoir for the urine, situated in the pelvis, behind the pubes and in front of the rectum in the male; the uterus and vagina intervening between it and that intestine in the female. An average bladder will hold about a pint.

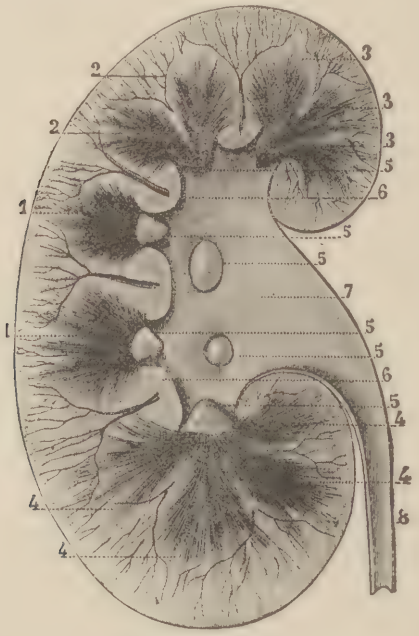
The tube which leads from the bladder and through which evacuation is effected, is the *urethra.*

The kidneys as excretory organs, separate from the blood certain materials which when dissolved in a quantity

of water, also separated from the blood by the kidneys, constitute the *urine.*

The manner in which the blood is conducted to the kidneys, there to be relieved of the urine and its constituent parts, and again returned to the venous system, is perhaps best shown on engraving No. 11.

The kidneys are not instrumental in forming the urine, but only in separating it from the blood.



Engraving No. 17.

Vertical Section through Kidney.

1. 2. 3. 4. } Pyramids of Malpighi.

5. Apices of the Pyramids.
6. Columns.
7. Pelvis of Kidney.
8. Upper Extremity of Ureter.

The urine is distinguished from other animal fluids by the fact that it represents the product of physiological disintegration. Every living being absorbs from without nutritive materials, which are modified by assimilation and converted into the ingredients of its tissues; and at the

same time its elements pass into new forms of combination, to be expelled as the product of disintegration.

Certain substances, therefore, are constantly making their appearance in the body, which were not introduced with the food, but which have been produced by retrograde metamorphosis. They are derived from materials which once formed part of the animal tissue, but which have become altered by internal transformation, and are no longer capable of aiding in the performance of the functions. The elimination and removal of these materials is the process of excretion, and the materials themselves are known as excrementitious substances.

The excrementitious substances are formed for the most part in the tissues, from which they are absorbed by the blood and conveyed to excretory organs by which they are discharged. If their elimination be impeded, their accumulation in the system produces disturbances. This disturbing influence is especially manifested in its action upon the nervous system, causing abnormal irritability, derangement of the senses, and in extreme cases, delirium, insensibility and death.

In the normal condition and in normal quantities the excrementitious matters are not poisonous, nor even deleterious; they are the natural products of functional activity, and therefore as essential to the manifestations of life as the nutritious material supplied by the food. It is only when their elimination is retarded that they interfere with the performance of the functions by deranging the constitution of the tissues.

Some of the excrementitious matters produced in the body are probably eliminated in small proportion with the perspiration or the fæces, and carbonic acid is abundantly exhaled from the lungs. But the most important of all these excrementitious matters are the characteristic ingredients in the urine.

The *Urine* is therefore solely an excretion. It is a

solution of the nitrogenous excrementitious matters of the body, and by its abundance and composition it indicates the activity of metamorphosis in the nitrogenous ingredients of the tissues and fluids. It also contains most of the mineral salts discharged from the body; and by the water which holds these matters in solution it presents a large proportion of the fluids passing through the system. Furthermore, accidental or abnormal ingredients introduced into the blood, are usually eliminated by this channel, and appear as temporary ingredients of the urine. The formation of urine is of the utmost importance, and only second to the functions of respiration.

The chemical composition of the urine as derived from numerous analyses is as follows in 1,000 parts :

Water	950.00
Urea	26.20
Other organic substances	2.02
Mineral salts	20.78
	1000.00

Urea is the most important constituent of the urine both in character and amount, forming more than one-half its solid ingredients and over eighty per cent. of all those of an organic nature. The most important fact known with regard to the origin of urea is that it is not formed in the kidneys but pre-exists in the blood and is drained away from the circulating fluid during its passage through the kidneys.

The daily average quantity of urine discharged in healthy male adults between twenty and forty years of age is a little over three and a quarter pints.

The urine is a clear, amber colored fluid of a watery consistency, and distinctly acid reaction. Its specific gravity is from 1020 to 1025.

Through the influence of the nervous system the secretion of urine is often modified to a considerable degree. Fear anger and various violent emotions sometimes pro-

duce a sudden and copious secretion of urine containing a large amount of water, and this phenomenon is often observed in cases of hysteria. Intense mental exertion produces the same result, and nearly everybody can observe that during a few hours of intense and unremitting mental labor, a frequent desire arises to urinate.

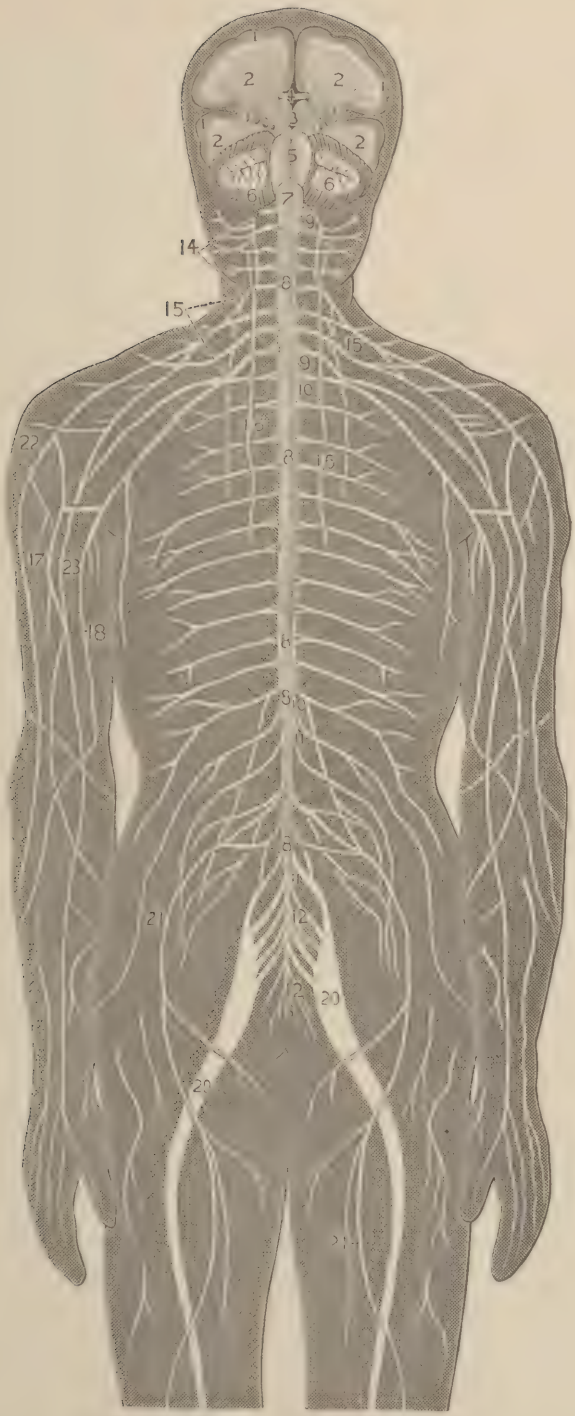
It is a well-known fact that young soldiers who are endowed with all the bravery imaginable, but who have not as yet actually participated in battle, find upon their first approach to the enemy's fire, through the nervous influences upon the urinary organs, that involuntarily emissions of urine have taken place.

For further information in reference to the urinary organs, both male and female, the reader is respectfully referred to Volume II, where these parts are still more minutely described.

THE NERVOUS SYSTEM.

(Engraving No. 18.)

1.	Gray Matter of Cerebrum.		Cranial.
2.	White Matter or Fibers of Cerebrum.		
3.	Optic Thalamus.		
4.	Corpus Callosum.		
5.	Pons Varolii.		
6.	Cerebellum or Small Brain (Vertical Section.		
7.	Medulla Oblongata (upper portion of Spinal Cord.)		
8.	Spinal Cord.		Spinal.
9.	Cervical or Neck Nerves,	8 pairs.	
10.	Dorsal Nerves,	12 "	
11.	Lumbar or Loin Nerves,	5 "	
12.	Sacral Nerves,	5 "	
13.	Coccygeal Nerves,	1 "	
		31 "	
14.	Cervical Plexus.		
15.	Brachial Plexus.		
16.	Phrenic Nerves.		
17.	Median Nerves.		
18.	Ulnar Nerves.		
20.	Sciatic Nerves.		
21.	Crural Nerves.		
22.	Musculo-cutaneous Nerves.		
23.	Musculo-spiro Nerves.		



Engraving No. 18. The Nervous System.

CHAPTER X.

THE NERVOUS SYSTEM.

The nervous system is the apparatus of communication, by which the various parts of the human body are brought into relation with each other, and different organs excited to harmonious and alternating action.

Its effects are produced by an influence transmitted from one region to another, stimulating or modifying the animal functions according to the requirements of the system at large.

The function of the nervous system is therefore to associate the different parts of the body in such a manner that stimulus applied to one organ may excite the activity of another.

The instances of this action are almost as numerous as the vital phenomena. The light falling upon the retina produces contraction of the pupil. Introduction of food into the stomach causes a discharge of bile from the gall bladder. Alimentary matters in contact with the mucous membrane of the intestine excite the peristaltic action of the muscular coat. Thus every organ is subservient in the manifestation of its activity to influences derived from other parts through the nervous system.

In the nervous system there are two kinds of anatomical elements, namely: *Nerve fibers* and *nerve cells*. The nerve fibers are the characteristic constituents of the "*white substance*," forming the mass of the nerves and their ramifications, the external portion of the spinal

cord, and much of the internal part of the brain. The nerve cells are found in the "*gray substance*," which constitutes the external or convoluted layer of the brain, as well as various internal deposits near its base, the central portion of the spinal cord, and many small detached masses, or ganglia, in different parts of the body.

The Nerve Cells, as far as is known, are the only parts capable, under any circumstances, of generating the nerve force, and do not receive impressions in any other way than through the nerve fibers.

The Nerve Fibers act only as conductors, and are incapable of generating nerve force. There is no exception to this rule.

Few of the anatomical elements present greater variations in size and appearance than the nerve fibers. Certain fibers found in the course of the nerves between the muscles are as large as $\frac{1}{125}$ of an inch in diameter, while others are only $\frac{1}{2500}$ of an inch.

The nerve fibers are channels of communication between the nervous centers on the one hand and the exterior organs on the other. For this purpose they are endowed with a special irritability by which, when excited at one end, they transmit the impulse throughout the entire length, and produce an effect at the other extremity. The nerves distributed to the skin, when excited, produce in the brain a corresponding sensation. Those distributed to the muscles when excited at their origin by the impulse of the will, cause contraction in the muscular fibers. It is evident that the fiber serves to communicate in some way an action from one extremity to the other; since, if it be divided in any part of its course the communication ceases, and sensation can no longer be perceived from impressions made on the skin.

Owing to the different effects thus produced at their extremity, the nerves and nerve fibers are distinguished by different names. Those which transmit the stimulus of

sensation from the surface to the centers are called *sensitive* nerves or nerve fibers; those which transmit the stimulus of motion from the nervous centers to the muscles are called *motor* nerves or nerve fibers.

No essential distinction is perceptible in anatomical characters between the sensitive and motor nerve fibers, only that the motor fibers are of a little larger diameter than the sensitive fibers.

Every collection of grey nerve substance is called a *nerve center* in which nervous impressions are received through the sensitive fibers from the periphery, and from which a stimulus is sent through the motor fibers to the muscles. While the nerve fibers accordingly are organs of transmission, the gray substance and its nerve cells are an apparatus in which the nervous influence is changed from one form to another.

The nervous center receives the impressions conveyed to it, and converts them into impulses to be transmitted elsewhere. How this change is effected in the nerve cells is unknown; but it is evidently essential to the physiological operation of the nervous system, since neither sensation nor movement is ever excited in the normal condition through the nerve fibers unless they are in communication with a nervous center.

Nerve Force. All acts of life such as the opening and closing of the eyelids and mouth; the perception of our surroundings; the execution of movements as done by our muscles; the listening to others, or the promulgation of our thoughts and wishes, originate within the nerve centers. These acts are the result of what may be called *Nerve Force.*

Its production is beyond the comprehension of the human mind and is one of the most remarkable of the phenomena of life; and its essence or the exact mechanism of its generation is one of the problems that thus far has eluded the investigations of the scientific world. It

is surely the trysting place of body and soul, of matter and mind. The human being must rest contented that it is so without being able to define this impenetrable mystery. A solution, however, will be had when the eyes of our soul begin to see, and those of our body are closed forever.

The nervous tissues of the body are comprised in two great systems—the *cerebro-spinal* and the *sympathetic*, and each of these systems consists of a central organ, or series of central organs and of nerves.

The Cerebro-Spinal System of Nerves consists of two centers, the spinal cord and the encephalon; the latter may be divided into the *cerebrum* or brain, the *cerebellum* or small brain; the *pons varolii* and the *medulla oblongata*.

THE ENCEPHALON.

The Brain is inclosed in a series of membranes. The first next to the skull is the *Dura Mater*. This membrane also forms the internal periosteum of the cranial bone. The next is the *Arachnoid* membrane, which is extremely thin and delicate, enveloping the brain lying between the former and the *Pia Mater* (nourishing mother) which is a highly vascular membrane, and it consists of minute networks of bloodvessels held together by an extremely fine tissue.

The brain is that portion of the cerebro spinal axis which is contained in the cranial cavity, and in the human being is heavier than that of all the lower animals excepting the elephant and whale. The brain of the former weighs from eight to ten pounds, and that of the whale in a specimen seventy-five feet long, weighed rather more than five pounds. The average weight of the human brain is about forty-nine ounces in the male, and forty-four ounces in the female.

The Cerebrum or large brain in man constitutes the

largest portion of the eucephalon. It is divided into two hemispheres, the right and the left. These hemispheres are two ovoidal masses, flattened against each other at the median line, where they are separated by the great longitudinal fissure, and presenting on their lateral surfaces a rounded or hemispherical form, whence their name is derived. They consist externally of a layer of gray substance from $\frac{1}{12}$ to $\frac{1}{8}$ of an inch in thickness.

The white substance of the hemispheres consists mainly of nerve fibers. The outer surface of the hemispheres presents a number of convoluted eminences separated from each other by depressions of various depths. The outer surface of each convolution, as well as the sides and bottom of the depressions; are composed of gray matter, which is called the cortical substance. By this arrangement the convolutions are adapted to increase the amount of gray matter without occupying much additional space, while they also afford a greater extent of surface for the termination of the white fibers in the gray matter.

In this connection the attention of the reader is drawn to the plate exhibiting the cerebro-spinal system of nerves, and at a glance a fair comprehension can be gained of the relation of the gray substance to the white fibers, and also the convolutions as portrayed in a vertical section. (Engraving No. 18.)

Functions of the Cerebrum. The most important functions belonging to the hemispheres, as a whole, are no doubt connected with the exercise of the intelligence. It is this part of the brain which is more developed in man as compared with the lower animals, and of all the nervous endowments it is the intellectual faculties in which he is most distinctly their superior. The cerebrum is shown to be in some way the especial organ of the mind.

It is certain that the cerebrum is not directly connected

with the maintenance of physical life, and is not, even in man, essential to its continuance. The hemispheres may be completely removed on both sides in fishes, reptiles, birds, and even in some mammalians, as the rabbit and the rat. In the higher quadrupeds large portions of their substance may be destroyed, leaving all the vital functions in activity. In man they may suffer extensive morbid alterations or mechanical injuries, accompanied by loss of substance, without fatal results.

One of the most marked instances of this kind was reported by Dr. Bigelow in the *American Journal of Medical Sciences*, Philadelphia, July, 1850, in which a pointed iron bar over one inch in thickness was driven through a man's head by the premature blasting of a rock. The bar entered the left side of the face near the angle of the jaw and passed through the anterior part of the cranial cavity, emerging from the frontal bone. The patient became delirious within two days of the accident, remaining partly delirious for about three weeks. He then began to improve, and at the end of two months from date of injury was able to walk. At the end of sixteen months the wounds were healed, and the patient had recovered his general health, though with loss of sight in the eye of the injured side. He survived for over twelve years, and was able to do work as a hostler, coachman and farm laborer, in all of which occupations he was employed at various intervals.

In man the general result of injury or disease of the hemispheres is disturbance of the intellectual faculties. Among the earliest and most constant of these phenomena is an impairment of memory. Hence if the loss of it is perceived through injury or disease of the cerebrum, it must have its seat there. It is likewise so with reason and judgment.

The manifestations of intelligence which are chiefly concerned in mental endowments are :

1. *Memory* is the simplest and most essential of faculties for the performance of intelligent acts. The recollection of names and of the objects to which they belong, is indispensable for even the use of articulate language; and a defective memory often seems the immediate cause of the incapacity of idiotic children. Memory is constantly essential in the ordinary occupations of life, in enabling us to retain past impressions as a guide for immediate or future acts.

2. *Reason* may be considered as the ability to appreciate the nature of nervous impressions, and to refer them to their external source. This is quite different from the simple power of perception which may continue unimpaired after extensive injury to the hemispheres. The mental action excited by an impression on the senses transfers our attention from the sensation to its cause; and when this action is prompt and effectual we acquire an idea both of the origin of the impression and its significance. The perfection of this quality consists in the certainty with which it appreciates the relation between cause and effect, and the relative importance of different phenomena. It is deficient or absent in idiots, and they consequently cannot avoid dangers or provide for their necessities. For the same reason it is useless to punish an idiot because although he may feel the pain inflicted, he does not refer it as a consequence to any previous act of his own. A similar deficiency in the insane or the weak minded produces a want of power to comprehend the importance and connection of different events. They are said to be "unreasonable," because they expect results which are unlikely to follow from certain causes, and because they assume the existence of causes which are not indicated by the results.

3. *Judgment* is the faculty by which appropriate means are selected for the accomplishment of a particular end. Its exercise requires the existence of memory and

reason, which supply the necessary conditions upon which it is based, while its own action is one which looks to the future rather than the past. An individual in whom the judgment is well developed employs, under the guidance of experience, means which are adapted to the end in view; one who is deficient in this respect resorts to means which are insufficient or inappropriate, and is consequently unsuccessful. Whether the act performed in this manner be a simple mechanical operation, like that of closing a window, to exclude the cold, or a complicated plan, involving many parts, the mental process is the same in kind, and differs only in degree; its essential character being that it is an intelligent act, based on an understanding.

It is evident that all such manifestations of intelligence are in the nature of reflex action. Their starting point is a sensation coming from without, giving rise in the nervous system to a series of internal operations, and terminating in an intelligent volitional impulse. This is reflected from within outward, and thus finally calls into action the voluntary muscles. The intermediate process between the sensation and the volition may be short and simple, or it may be long and complicated, involving the continued suggestion of many successive ideas. There can be little doubt that in either case, it is accompanied by actions of some kind in the grey substance of the cerebrum; for if these organs are injured or defective, the mental operations are obstructed or disturbed.

It is also a well established fact, that center of speech is located in a well defined and restricted portion of the anterior lobes. While these data are exclusively drawn from pathology, physiological researches are a unit, that there is no point in the brain which is more exactly determined than the seat of the faculty of speech.

The *Cerebellum* or small brain, is that portion of the encephalon which is contained in the inferior occipital

portion of the skull. It is situated beneath the posterior lobes of the cerebrum, from which it is separated by the *tentatorium*. In the infant the cerebellum is proportionately much smaller than in the adult, the relation between it and the cerebrum being as between 1 to 13 in the adult and 1 to 26 in the infant. The maximum weight is attained between the ages of 25 and 40 years, and averages 5 1-2 ounces.

Like the cerebrum, the cerebellum is divided into two hemispheres or lobes.

The *gray matter* of the cerebellum is found on the surface, and as independent masses in the interior.

Functions of the Cerebellum. In this connection it is proper to state that the definition of the function of the cerebellum is one of the points stated by many physiological authors as doubtful and unsettled, and this is so mainly because some writers have been unable to harmonize the experimental facts with cases of diseases or injury to the cerebellum in the human subject. From experiments made upon living animals, the following conclusions have been arrived at:

That there is a necessity for harmony of the movements of the general voluntary system of muscles by means of a nerve center.

That whatever other function the cerebellum may have, it acts as the center presiding over equilibrium and general muscular co-ordination.

The cerebellum has its nervous connections with the general muscular system through the posterior white columns of the spinal cord, a fact which is capable both of anatomical and physiological demonstration.

If the cerebellum be extirpated there is loss of co ordinating power, and if the posterior white columns of the cord be completely divided, destroying the communication between the cerebellum and the general system, there is also loss of co-ordinating power.

When a small portion only of the cerebellum is removed, there is slight disturbance of co-ordination, and the disordered movements are marked in proportion to the extent of the injury to the cerebellum.

After extirpation of one-half or two-thirds of the cerebellum, the disturbance in co-ordination immediately following the operation may disappear, and the animal may entirely recover without any regeneration of the extirpated nerve substance. This important fact enables us to understand how, in certain cases of disease of the cerebellum in the human subject, when the disorganization of the nerve tissue is slow and gradual, there may never be any disorder in the movements.

The opinion that the cerebellum is the organ of the instinct of generation, seems to be a settled fact with a good many people. It is hoped however, that a refutation of this preposterous idea is unnecessary, as it has been proven time and time again, in operation on the lower animals, that the entire extirpation of the cerebellum did not destroy the instinct of generation.

The Medulla Oblongata is the upper enlarged part of the spinal cord, and extends from the upper border of the atlas to the lower border of the pons varolii.

The Medulla Oblongata, like the spinal cord, consists of both grey and white matter; in places, however, the grey matter is exposed on its posterior surface.

Functions of the Medulla Oblongata. The physiological properties of the medulla are more distinctly marked than those of any other part of the brain mass. It is in a high degree both sensitive and excitable, especially in its posterior portions.

The most important action of the medulla as a nervous center is that connected with *respiration.* So long as the medulla is uninjured, although the cranium be emptied of all its nervous centers, respiration goes on without essential modification. But if the other parts of the brain

be left intact and the medulla be destroyed, in any warm-blooded animal, all movements of respiration cease instantaneously.

The circulation still continues for a time, but as the blood becomes deficient in oxygen, it is gradually retarded and after several minutes comes to an end.

The medulla is a center from which the whole respiratory apparatus derives its stimulus, and in man, quadrupeds and birds it is the most important part for the immediate preservation of life.

Deglutition is also under the control of the medulla. Mastication of the food, and its transfer by the tongue to the entrance of the fauces, are voluntary actions, which may be continued or arrested at will. But when the food has passed from the mouth to the pharynx the process of deglutition, by which it is carried into the stomach is reflex and involuntary.

The medulla is furthermore connected with *phonation.* In the exercise of the voice, however, the preliminary actions of intelligence, volition or emotional excitement require the co-operation of other parts of the encephalon, but the immediate mechanism by which a vocal sound is produced has its nervous center in the medulla oblongata.

The medulla oblongata, in connection with other parts, is also the direct source of the movements of the tongue and lips.

Therefore this important part of the encephalon is the seat of reflex actions connected with the immediate preservation of life, since it maintains the movements by which air and food are introduced into the body. It also presides over the muscular combinations concerned in the voice and articulation, and by this means establishes an intelligible communication with the external world.

The Pons Varolii is the bond of union of the various segments of the encephalon, connecting the cerebrum above, the medulla oblongata below, and the

cerebellum behind. It is situated above the medulla oblongata, below the cerebrum and between the hemispheres of the cerebellum.

THE CRANIAL NERVES.

These consist of twelve pairs, having their origin within the substance of the brain, hence the name *cranial nerves*, and are distributed to different parts of the head and face.

The following will show their respective arrangement:

First pair, or *Olfactory nerve* is the special nerve of the sense of smell.

Second pair, or *Optic nerve* is the special nerve of the sense of sight, and is distributed exclusively to the eyeballs.

Third pair, or *Motor oculi nerve* supplies all the muscles of the orbit, and also sends some filaments to the iris.

Fourth pair, or *Pathetic nerve* is the smallest of the cranial nerves, and supplies the superior oblique muscles of the eye.

Fifth pair, or *Trifacial nerve* is the largest of the cranial nerves. It is a nerve of common sensation, and of motion. It is the great sensitive nerve of the head and face, the motor nerve of the muscles of mastication, and its tongue branch is probably one of the nerves of the special sense of taste.

Sixth pair, or *Abducent nerve* supplies the external rectus muscle of the eye.

Seventh pair, or *Facial nerve* is the motor nerve of all the muscles of expression in the face.

Eighth pair, or *Auditory nerve* is the special nerve of the sense of hearing, being distributed exclusively in the ear.

Ninth pair, or *Glosso pharyngeal nerve* is distributed, as its name implies, to the tongue and pharynx, being the nerve of sensation to the mucous membrane of the

pharynx, fauces and tonsils, and a special nerve of taste in all the parts of the tongue.

Tenth pair, or *Pneumogastric nerve* has a more extensive distribution than any other of the cranial nerves, passing through the neck and thorax to the upper part of the abdomen. It supplies the organs of voice and respiration with motor and sensory fibers, and the pharynx, œsophagus, stomach and heart with motor influences.

Eleventh pair, or *Spinal accessory nerve* consists of two parts:

1. The accessory part is principally distributed to the pharynx and larynx.

2. The spinal part is distributed to the muscles of the neck.

Twelfth pair, or *Hypoglossal nerve* is the motor nerve of the tongue.

THE SPINAL CORD.

The spinal cord (medulla spinalis) is the cylindrical elongated part of the cerebro spinal axis, which is contained in the vertebral canal. Its length is usually about seventeen or eighteen inches. It occupies in the adult the upper two-thirds of the vertebral canal, extending from the upper border of the atlas to the lower border of the body of the first lumbar vertebra.

The cord consists of an outer part, composed of medullated nerve-fibers, which is the white substance, and of a central part, the gray matter, both supported in a peculiar kind of connective tissue. The cord sends its nerves to the muscles and integuments of trunk and limbs, and consequently acts in a double capacity: First, as a medium of communication between the brain and the peripheral organs; and secondly, as an independent nervous center, with special endowments of its own.

The *membranes* which envelope the spinal cord are three in number, and identical with those of the brain, of

which they are continuations. The most external is the *dura mater*, a strong, fibrous membrane, which forms a loose sheath around the cord. The most internal is the *pia mater*, a cellulo-vascular membrane, which closely invests the entire surface of the cord. Between the two is the *arachnoid* membrane, an intermediate structure which envelopes the cord and is connected to the pia mater by slender filaments of connective tissue.

Function of the Spinal Cord. The general character of reflex actions of the spinal cord is that they tend unconsciously to the *defense* or *preservation* of the body. It has also an important action in regard to attitude and locomotion. Another important function of the spinal cord as a nervous center, is its control over the *sphincters* and the muscles of *evacuation*. While the small intestines, the cæcum and the colon are supplied exclusively with nerves from the sympathetic system, the lower portion of the rectum receives branches of the sacral plexus of spinal nerves. These latter nerves are voluntary, and thus it happens that a desire for stool can be controlled for a time by will power.

The spinal cord, in its character as a nervous center, exerts a general protective influence over the body. It presides over the involuntary movements of the limbs and trunk; it supplies the requisite nervous connection for the attitude and locomotion; and by its control over the rectum and bladder, it regulates the accumulation and discharge of the excrementitious products of the system.

The spinal cord, as a medium of communication between the brain and peripheral organs, exerts a crossed action. Sensitive impressions received by the skin on one side of the body are conducted through the cord to the opposite side of the brain, and motor impulses originating on one side of the brain, pass to the nerves and muscles on the opposite side of the body.

THE SPINAL NERVES.

The Spinal Nerves are so called because they take their origin from the spinal cord, and are transmitted through the inter-vertebral openings on either side of the spinal column. There are thirty-one pairs of spinal nerves, which are arranged in the following groups, corresponding to the region of the spine through which they pass:

Cervical or Neck	8 pairs.
Dorsal or Back	12 "
Lumbar or Loin	5 "
Sacral	5 "
Coccygeal	1 "

Each spinal nerve arises by two roots, an anterior or motor root, and a posterior or sensory root.

The anterior roots are the smaller of the two, devoid of any ganglionic enlargement, and their component fibrils are collected into two bundles near the inter-vertebral opening.

The posterior roots of the nerves are larger, but the individual filaments are finer and more delicate. As their component fibrils pass outward toward the aperture in the dura mater they coalesce into two bundles, receive a tubular sheath from that membrane, and enter the ganglion which is developed upon each root.

At some parts of their course certain branches of the nerves reunite, forming networks called plexuses. Thus the four upper cervical nerves anastomose and form the cervical plexus. From the third and fourth cervical nerves arises the *phrenic nerve*, right and left respectively. It is the motor nerve of the diaphragm.

The branches of the upper four cervical nerves are distributed within the muscles of the neck.

The *Brachial Plexus* is formed by the union of the anterior branches of the four lower cervical and the

greater part of the first dorsal nerves. This plexus extends from the lower part of the side of the neck to the axilla.

The principal branches of nerves descending from the brachial plexus into the arm are the *ulnar* and *median* nerves. The former is placed along the inner or ulnar side of the upper limb, and is distributed to the muscles and skin of the forearm and hand. Nearly everybody has had experience with this nerve, as it is the one which passes on the inner side of the so-called "funny bone" at elbow. Knocking against this bone causes excruciating pain, incident by the pressure against this nerve.

The *Median Nerve* has received its name from the course it takes along the middle of the arm and forearm to the hand. It distributes branches to the thumb and fingers.

The *Dorsal Nerves* are distributed to the muscles of the back and between the ribs.

The last or twelfth dorsal and the first four *lumbar* nerves form the lumbar plexus, which sends nerves to ramify upon the muscles and skin of the abdomen and lower extremities.

The last lumbar and four upper *sacral* nerves form the sacral plexus, which distributes nerves to the muscles and skin of the hip and lower extremities.

The principal branch of this plexus is the *Great Sciatic Nerve*, which supplies nearly the whole of the integument of the leg, the muscles of the back of the thigh, and those of the leg and foot. It is the largest nerve cord in the body, measuring three-quarters of an inch in breadth, and is the continuation of the lower part of the sacral plexus. It passes out of the pelvis through the great sacro-sciatic opening. It descends along the back part of the thigh to about its lower third, when it divides into two large branches.

The last of the spinal nerves is the *coccygeal*. It is

but a delicate filament which terminates in the coccygeal regions.

The manner in which these nerves unite and reunite, giving off branches in all directions, is best comprehended by examining engraving No. 18. This illustration should be well impressed upon the mind of the reader, when studying the wonderful network of nerves, which is found permeating throughout the whole system. It shows at a glance how the nerves, represented by the cords of the engraving, radiate in all directions, and find a trysting place in the axis (the brain and spinal cord). An illustration of this kind is not only a graphic object lesson, but also food for thought, which in a sane person must bring adoration for the Creator, and in the skill displayed in making the human body a piece of perfect mechanism, in which every portion, without exception, is under the influence of the nervous system. It is hoped that the reader understands that only a small portion of the nerve cords are displayed on the engraving. It would be beyond human skill to portray on a small surface all the nerve fibers radiating throughout the body; for do we not perceive the prick of the pin, or does the face not become reddened from shame, or white and ghastly through anger?

CHAPTER XI.

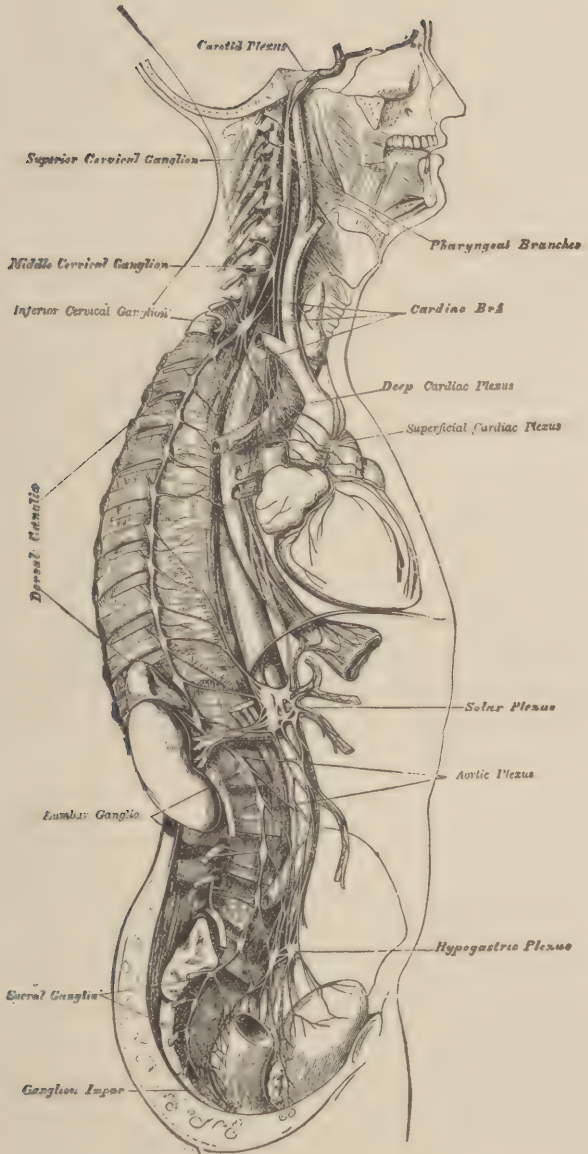
THE SYMPATHETIC NERVOUS SYSTEM

Is composed of a series of ganglia connected together by intervening cords, extending on each side of the vertebral column from the base of the skull to the coccyx; and of three plexuses or aggregation of nerves and ganglia, situated in front of the spine in the (1) thoracic, (2) abdominal and (3) pelvic cavities; also of numerous nerve fibers, which supply the viscera of respiration and digestion, as well as the muscular coats of the bloodvessels with nerves. It is by means of the bloodvessels that the sympathetic nerves are distributed to all parts of the body.

To describe by means of a pen portrayal, and attempt to bring before the reader a vivid picture in that manner, the complications of the sympathetic nervous system would be folly, unless the student's mind had been specially prepared.

Hence we have concluded to give herewith a reproduction of the engraving, made after dissections by that nestor of anatomy, Dr. Henry Gray, F. R. S. London. It shows the different ganglia and plexuses in their proper position. From its study, and from the description we shall give of the functions of the sympathetic nerves, etc., named thereon, it is hoped to aid the reader in gaining what little knowledge the scientific world has given us upon this subject.

Carotid Plexus. The main function of the nerves in this plexus is the regulation of the flow of blood to the



Engraving No. 19.

The Sympathetic Nerves.

brain, and its fibers serve as connecting links between the two nervous systems, in this locality.

Superior, Middle and Inferior Cervical Ganglion. These ganglia are united by the sympathetic cord, also act as vaso-motor nerves of the bloodvessels entering and leaving the cranial cavity and surroundings. These nerves communicate freely with adjacent spinal nerves and branches of it form the deep and superficial *Cardiac Plexus,* which regulates the actions of the *Heart.*

The *Dorsal* or *Thoracic Ganglia* are twelve in number and are united by the sympathetic cord. They each communicate by two filaments with the spinal nerves. This chain of Ganglia gives off branches to the blood-vessels of the thorax, the respiratory organs, and forms connections with the plexuses and ganglia in the lower viscera.

The *Solar or Epigastric Plexus* and branches exercise their nervous influence upon the following organs: Diaphragm stomach, liver, spleen, kidneys, the testes in the male the ovaries in the female, the intestines, the upper part of the rectum, abdominal aorta and vena cava. The filaments follow the distribution of the bloodvessels arising from and tributary to the last mentioned artery and vein. This plexus is the largest and most important in the system.

The *Lumbar Ganglia* is a continuation of the dorsal ganglia. It supplies the loin muscles and bloodvessels in that vicinity.

The *Aortic Plexus* is the special network of nerves controlling the important bloodvessels of that name and branches thereof.

The *Hypogastric* or *Pelvic Plexus* supplies the viscera of the pelvis and causes the peculiar phenomena frequently exhibited by the procreative organs.

The *Sacral Ganglia* acts as a connecting chain for the foregoing with the sympathetic cord, and gives off branches for the bloodvessels in its locality.

Vaso Motor Nerves. Inasmuch as the circulation of the blood is one of the necessities of material existence, it must be apparent that the nerves connected with the bloodvessels, and thus regulating the flow of the blood, are of the utmost importance. The nerves of the sympathetic system performing this function are called the *Vaso motor nerves.* Their filaments and minute plexuses are especially associated with the arterial branches which they follow throughout their ramifications. The distribution of these fine nerve fibers are in the muscular coat of the bloodvessels. Under the influence of these fibers the muscular elements of the vessels contract, approximating the walls of the arteries, and diminishing their caliber. Hence, when the blood current in its ever changing stage as to quantity, becomes more or less, the walls of the vessels conform to its contents. It is in consequence of this, when these vaso motor nerves have become paralyzed from the injudicious indulgence in alcoholic beverages, that the nerves lose control over the bloodvessels, and the nutrient fluid is driven through the internal calorification to the surface, as is evidenced by a flushed face, bloodshot eyes, a muddled brain, and other symptoms of drunkenness.

This diversion of blood from the internal organs, to those of the surface is conformable to the laws of equalization in temperature.

We cannot refrain from giving here the summary in regard to the sympathetic system, as made by Prof. Austin Flint, Jr. He says:

"According to the latest researches, the filaments of the sympathetic, at or near their termination, are connected with ganglionic cells, not only in the heart and the uterus, but in the bloodvessels, lymphatics, coccygeal gland, the sub-mucous and the muscular layer of the entire alimentary canal, the salivary glands, pancreas, the excretory ducts of the liver and pancreas, the larynx, trachea, pulmonary tissue, bladder, uterus, the entire gen-

erative apparatus, supra renal capsules, thymus, lachyrmal canals, ciliary muscles and the iris. In these situations nerve cells have been demonstrated by various observers, and it is probable that they exist everywhere in connection with the terminal filaments of this system of nerves."

The reader should always bear in mind that through intimate connection of the cerebro spinal and sympathetic systems of nerves, every part of the human body is closely united and made one whole. Thus all voluntary acts emanating from the central axis are carried by the nerve fibers to the organs of locomotion or execution. The latter are regulated as to supply of nutriment, secretion, etc, by the sympathetic nerves, which are beyond the control of the will.

The gray substance of the nerve mass, is the great dictator, and the fibers are the executors. When the latter fulfil their instructions, harmony in the wonderful chemico mechanical machine exists, everything runs smoothly, and life is enjoyment. But if the seat of sensibility is dormant from injury or disease, or the executors of the will are impaired, disorganization takes place. Muscles refuse to act, respiration is difficult, the blood becomes sluggish, digestion impaired, and it is not long till the whole system collapses, as if the fire had died under a boiler, the machinery stops. Life becomes extinct, and the abode of the soul returns to the element from which it was taken.

CHAPTER XII.

THE SENSES.

Human beings owe their superiority over animals to the possession of senses, by which they gain perception of external objects.

Through the senses we receive and impart information and they act as channels for all conscious relation with our surroundings. The term "sensation" is defined by Webster as, "An impression, or the consciousness of an impression, made upon the central nervous organ, through the medium of sense." A sensation can also be a purely spiritual or psychical affection; agreeable or disagreeable feelings occasioned by objects that are not corporeal or material.

The senses are five in number, and each is devoted to a particular class of phenomena.

1. THE SENSE OF TOUCH.
2. THE SENSE OF TASTE.
3. THE SENSE OF SMELL.
4. THE SENSE OF SIGHT.
5. THE SENSE OF HEARING.

The Sense of Touch is the faculty by which we perceive the consistency, surface, temperature and mass of objects surrounding us. It is produced by the contact of foreign bodies with the sensitive surface of the body. This sensibility exists throughout the general skin, and in the mucous membrane near the exterior parts of the body. The anatomy of the skin and its appendages has been

described heretofore, and in perusing this subject the reader is referred to engraving No. 7.

Thus, when any of the external parts of the body come in contact with any material object, the sense of touch gives us information as to its solidity, shape or form, and indifferent or irritating qualities.

The sense of touch is not equally developed over the surface of the body, but certain parts have a suitableness. Thus, in man, this sense is best developed in the hands, owing to the varied movements the fingers are capable of. Of the mucous membranes, which are highly organized to perceive touch, are those of the eyelids, the nostrils, inside of lips and cheeks, and the anterior two-thirds of the tongue.

The sense of touch is capable of being educated, and is almost always extraordinarily developed in persons who are deprived of the sense of sight. The blind learn to recognize individuals by feeling the face. A remarkable instance of this is quoted in physiological works, of the blind sculptor, Giovanni Gonelli, who was said to model the most striking likeness entirely by the sense of touch. Other instances of this kind are on record. A great many blind people are known to have become very proficient in botany, simply guided by the sense of touch. It is perhaps unnecessary to draw attention to the fact that blind persons learn to read with perfect facility, by passing the fingers over raised letters, but little larger than the letters in an ordinary folio Bible.

The accessory organs of the skin, especially the hair in the ear, nose, around the mouth, are very sensitive to touch, especially so when it is of a titillating nature.

Titillation is a sensation familiar with everybody, but cannot so easily be described. It is due to delicate impressions made in unusual situations, and is remarkable chiefly on account of the reflex movements which it oc-

casions. As, for instance, if the soles of the feet be tickled, it is almost impossible to avoid movements of the limbs.

The appreciation of *temperature* is generally most highly developed in parts where the nerves lie nearest the surface.

Pain is produced by mechanical irritation, by excessive heat or cold. It only appears when the intensity of the impression thus made rises above a certain degree. Thus, if the point of a knife or needle is gently brought in contact with the skin, we perceive only its form and surface. If the pressure be increased to such an extent as to wound the skin, the perception of the physical properties of the knife or needle ceases, and we become conscious of the pain inflicted.

The appreciation of *cold* and *heat* is only possible within certain limits, and when either is so excessive as to produce pain, all accurate conception of the degree of temperature is lost.

The pain incident on coming in contact with a red hot piece of iron, or one at a temperature much below freezing point of water, is essentially one and the same, and the sensation thus produced is not marked by heat or cold, but only by the pain it causes.

The capacity of feeling pain can be reduced or entirely abolished by use of anæsthetics, such as ether and chloroform, and under their influence wounds may be dressed unaccompanied by any sense of pain.

The Sense of Taste enables us to appreciate the savor of certain substances introduced into the mouth. It attains great perfection in epicures. It resides in the mucous membrane which invests the surface of the tongue. The structure of this membrane is analogous to that of the skin, and consists of two layers, the epidermic and dermic layers. The papillæ or projections of the dermis, visible to the naked eye on the tongue, are also the seats of tactile and gustatory sensations.

The tongue is not the only organ of taste, for the whole surface of the mucous membrane lining the back of the mouth participates in this function. The sense of taste exists, in general terms, in parts supplied by filaments from the lingual branch of the fifth and ninth nerves. (See the remarks made on these nerves.)

It is necessary in order that a body should have taste, or become sapid, that it be in a state of solution, or be reduced to this state by the saliva.

Of the senses none perhaps is subject to so much variation in different individuals, as taste. Some are depraved, and others are highly cultivated. These cultivations are all acquisitions, as it is well known that persons who live on ordinary food and drink have no cravings for the toothsome articles and wines and liquors. Disease modifies it to a great extent, and food and drink which we partake of in state of health with the utmost relish produces a real abhorrence when we are sick. Patients often become accustomed to the most disagreeable remedies, and take them without repugnance.

The fatty substances enjoyed by the Esquimaux with the greatest gusto find no favor with people in hot climes, and likewise the fruits of the tropical regions have no charms for the inhabitants of the frigid zones.

True tastes are quite simple, presenting the qualities which are recognized as sweet, acid, saline and bitter. The more delicate shades of what are called flavors nearly always involve the sense of smell, which in some instances is difficult to separate entirely from that of taste.

When the sense of taste becomes impaired through over-cultivation and the partaking of exclusive artistic dishes, there is only one remedy, and that is *total abstinence.* The practice of this for a limited period lends a delicious flavor to the most simple kind of food.

In concluding our remarks on the sense of taste, we desire to draw once more attention to what a great extent

taste is acquired, as is evidenced by the use of tobacco, so extensively used in civilized countries, without contributing to the elevation of civilization.

The Sense of Smell. Through the distinguishing character of the sense of smell we are enabled to perceive odorous flavors, and to detect odoriferous matters at a distance and when concealed from sight. The appreciation of the quality of gaseous and vaporous substances is also the property of the sense of smell, which is distinctly localized and confined to the upper portion of the nasal passages, where the olfactory or first pair of cranial nerves spreads its filaments. The membrane in which these nerve fibers are ramified is called the *olfactory membrane*.

The sense of smell is closely allied to that of taste, and specially so in the detection of the quality of food before it enters the mouth, and some wag for this reason has called the nose the "Eye of the Stomach." This is further proven when we smell a particularly favorable morsel, by the simultaneous action of the salivary glands in giving off the ever ready saliva, so needful to the perception of taste and the proper performance of digestion.

The perfection of smell is not in direct relation to the development of the nasal appendages; it is not the largest nose which possesses the most acute smell, for this faculty depends specially on the extent of the nasal cavity. To the last mentioned peculiarity the dog and the hog are indebted for the acuteness of their smell.

The nose becomes habituated to odors, whether they be agreeable or disagreeable. This is specially the case with odors emanating from within the body, such as fetid breath or the sour gases arising from the stomach. Persons become so used to these that they are not noticed by themselves.

The laborer in a fertilizer factory or the tanner around his vats does not perceive the terrible stench arising there-

from simply because the olfactory nerves of these people have become familiar with the odor. The mechanism of smell may be explained as follows: As the odoriferous vapors arrive in the upper part of the nasal passage, they are probably dissolved in the secretions of the olfactory membrane, and thus brought in contact with the nerve filaments. Inflammatory disorders interfere with the sense of smell, both by altering the secretions of the part and by causing swellings of the mucous membrane and obstruction of the nasal passage.

The Sense of Sight. It is with justice that the organ of vision, the eye, is often called the mirror of the soul, for through it we give such wonderful expressions unexplainable in themselves, and also receive through this, the most remarkable of all senses, impressions and a variety and volume of information from external objects.

Through the sense of sight we receive impressions of light, color and shade in all modifications of intensity and combination. Through it are also formed our principal ideas of shape, movement and space.

The Eye receives the impressions of light, whether near or remote; it is even capable of discerning the twinkling light of the stars of heaven, notwithstanding their immeasurable distance.

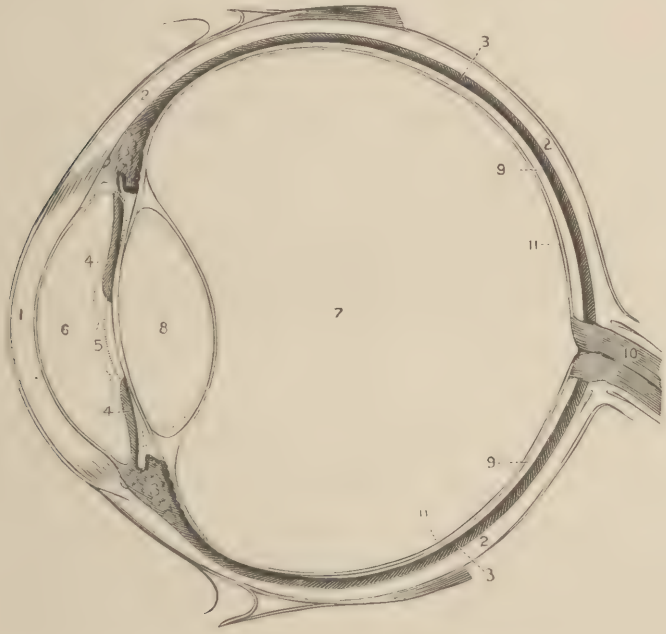
When the immortal blind poet of England, John Milton, sang:

"O loss of sight, of thee I most complain,"

he surely felt that sight affords the most continuous and indispensable aid for all the ordinary occupations of life.

The Eyeball is contained in the cavity of the orbit. In its situation it is securely protected from injury, whilst its position is such as to insure the most extensive range of sight. It is acted upon by numerous muscles by which it is capable of being directed to any part, and is supplied by nerves and b'oodvessels.

Thus the apparatus of vision comprises the globe of the eye and the accessory organs which serve to protect and move it.



Engraving No. 20.

Horizontal Section through Eyeball. (Magnified.)

1. Cornea
2. Sclerotic Coat.
3. Choroid Coat.
4. Iris.
5. Pupil.
6. Aqueous Humor.
7. Retinal Cavity filled with Vitreous Humor.
8. Crystalline Lens.
9. Retina.
10. Optic Nerve.
11. Hyaloid Membrane.

By studying the engraving which is a horizontal section through the eyeball, it will be seen that the globe of the eye is a spherical mass composed of several superposed coverings and of solid and fluid refracting media called *lens* and *humors*.

The most external is the *sclerotic coat* or white of the eye, receiving its name from its extreme density and hardness. The word is of Greek origin, and means "hard."

The cavity formed by the sclerotic coat is filled with fluid and gelatinous material, and on its anterior is pro-

vided with a transparent portion, the *cornea*. Posteriorly the eyeball is lined with the filaments of the optic nerve, forming upon its inside a nervous expansion called the *retina*. The latter is extremely sensitive to light and receives the luminous rays admitted through the cornea. The cavity of the eyeball can therefore be justly compared to a room with but one window in front where all the light enters and strikes the back wall of the apartment.

The engraving also shows that in addition to the previously mentioned parts the eye has a transparent refracting apparatus with convex surfaces—this is the *crystalline lens*. The lens concentrates the light at the retina. In front of the lens is an arrangement called the *iris*, which regulates the amount of light which shall enter the cavity of the retina through its central orifice, the *pupil*. The *choroid coat* of the eye forms the inner lining of the sclerotic and the posterior surface of the iris, thus preventing the reflection of the rays of light and absorbing it when it once has passed through the retina.

The wonderful invention of photography received its first inception from the construction of the eyeball and a photographic camera can be favorably compared with the organ of vision. The plate sensitized through nitrate of silver and other chemical substances forms the retina, and receives in a chemico-mechanical way the impression of the object in front of it, while the optical glasses of the tube perform the offices of the cornea and crystalline lens of the eyeball. The blackened inner surface of the photographer's instrument is similar to the choroid coat of the eye.

The *cornea* derives its name from its horny consistency and appearance, and forms the anterior part of the walls of the eye. It is a continuation of the sclerotic coat, differing in its physical appearance in so much that the cornea is colorless and transparent to such an extent that the iris

and pupil are visible through its substance, while the sclerotic coat is white and opaque. The cornea is thicker at its edges than at the center, the two measurements being $\frac{1}{30}$ and $\frac{1}{25}$ of an inch respectively.

The *choroid coat* is a highly vascular and pigmentary membrane of a dark color and lines the inner surface of the sclerotic; anteriorly it becomes thicker, forming the so-called ciliary process which holds the lens in place with the aid of the suspensory ligaments.

The *Iris* is of different colors in different persons and extends across the cavity of the eyeball. It is also attached to the anterior portion of the choroid. The Iris is composed of circular fibers situated near the margin of the pupil, which when contracted diminish the orifice of the pupil, and when relaxation ensues cause the enlargement of the orifice. Interwoven with the circular are radiated fibers which form the muscular element of the iris, and through which the ciliary nerves act upon it.

The word "*iris*" means "rainbow," and it is with truthfulness that this appellation has been made for the color is about as varied as that of the welcome vision to Noah.

We have all sorts of eyes in the human family, blue, gray, brown and black as a rule, and red in the Albino. All these colors depend on the abundance and disposition of its pigmentary elements.

Thus in the people in high latitudes bordering the Arctic and Antarctic regions where darkness is of greater duration than light, we find blue eyes predominating and the pigment forming this color, is the proper one in the wisdom of the Creator. In the equatorial and adjacent regions, north and south thereof, where the rays of the sun are strongest, the people have black or dark brown eyes, while in the temperate zones the inhabitants have a happy medium between the two extremities of color.

Aqueous and Vitreous Humors. The eyeball is

divided into two chambers, an anterior and posterior, the iris forming the partition wall. The anterior apartment is filled with a watery transparent fluid called the *aqueous humor*. This fluid serves to maintain the internal tension of the eyeball and to allow of changes in the iris and crystaline lens, without effecting external configuration of the cornea. The posterior chamber is the larger of the cavity of the eyeball. It is filled by a semi-gelatinous substance, the *vitreous humor*, so called from its transparent and glassy appearance. Its refractive power is about equal to that of water. It distends the greater part of the sclerotic, supports posteriorly the retina and anteriorly the lens. It also preserves the spheroidal form of the eyeball.

Crystalline Lens. The lens is a transparent, refractive body with convex surfaces, front and behind. It is placed directly in front of the pupil. It is held in proper balance in front by the aqueous humor, and in rear by the vitreous body, and by the processes of the choroid coat, above and below. The lens is the strongest refracting body in the eyeball, and by it the rays of light are brought to a focus upon the retina.

Retina. This membrane is endowed with the special sense of sight, the other structures being accessory, hence it may be considered the most essential part of the eye. It forms a nearly transparent membrane, composed of numerous layers of rods and cones. It is situated between the inner surface of the choroid and the outer surface of the vitreous humor. The *optic nerve* or second pair, of which the nervous substance of the retina is a continuation, penetrates the eyeball a little internal to and below the antero-posterior axis.

The *optic nerve* and its *fibers* are insensible to light, notwithstanding the fact that this nerve is capable of transmitting impressions of light made upon the retina, from it to the brain. Hence, the region as above described, where

the optic nerve makes its entrance into the cavity of the eyeball, owing to the absence of the retinal substance upon its surface, is insensible to the luminous rays, and for this reason is called the *blind spot.*

The *yellow spot* of the retina is the point of distinct vision, where the image of an object in the direct line of light falls upon the retina. It is oval in shape, one-eighth of an inch at its longest, and one thirty-sixth of an inch at its shortest diameter. This spot is distinguished from the remainder of the retina by its yellow color. At the center of it is a minute depression, called the *fossa centralis.* Here the retina is reduced to about one-half. The fossa centralis is the most sensitive spot on the retina.

Muscles which Move the Eye. Each eyeball is supplied with six distinct muscles; the names are the (1) external; (2) internal; (3) superior; (4) inferior recti; (5) superior oblique; (6) inferior oblique muscles. The four first named move the eye up and down, right and left, and the two oblique muscles hold it in proper balance.

The *orbit*, or *socket* for the eyeballs is formed by the union of the bones of the face, lined with a fatty tissue, forming the nest of the eyeball.

The *eyelids*, upper and lower, enable the eye to shut off the rays of light.

The *eyelashes* protect the eye from dust and dirt.

The *eyebrows* serve to shade the eye from excessive light, and protect the lids from perspiration from the forehead.

Situated in the upper and lower eyelids are found the *Meibomian glands*, which secrete an oily fluid, smearing the edges of the eyelids and preventing the overflow of tears.

To the right and left respectively of each eyeball, and embedded within the cavity of the orbit, are the *tear* or *lachrymal glands*, which secrete from the blood a thin, watery fluid, which bathes constantly the eyeballs. The

fluid is spread over the globe by the movement of the lids and eyeballs. The excess of tears under ordinary circumstances is conducted through the tear canal, into the nasal passage

The secretion of the lachrymal fluid or tears is readily influenced through the nervous system, and when thus affected, either through joy, emotion, laughing, coughing, sneezing, smelling certain substances, an overflow takes place, and the tears run over the cheeks.

The Sense of Hearing. This sense transforms impressions of sound into sensations, and appreciates their intensity and their higher or lower notes.

Sound is produced by speech, reeds, strings, wind instruments, and by concussions of solid, liquid or aerial bodies. The impressions thus made upon the ear, the organ of hearing, depend on the vibrations excited in the atmosphere.

A simple and very common illustration of this fact is afforded by the experiment of striking a bell carefully arranged *in vacuo*. While the stroke and vibrations can readily be seen, there is no sound, and if air is gradually introduced, sound becomes appreciable.

Vibrating bodies can be made to perform and impart to the atmosphere oscillations of greater or less amplitude. The intensity of sound is in proportion to the amplitude of vibrations. If a tuning fork is made to vibrate, the sound is at first loud, but the amplitude gradually diminishes, and the sound dies away till it is lost.

Intensity of sound is diminished by distance, as the amplitude of the waves and the velocity of the vibrating particles become weaker, the farther we are removed from the sound producing the body.

Sound travels at an enormous rate of speed. The intensity of it is, however, immaterial, as the whisper of a human being and the roaring of a cannon will travel at an even rate, and differing only in its amplitude or last-

ing qualities. The velocity of the sound depends entirely upon the elasticity of the conducting medium. Thus atmospheric air at 32°F. will conduct sound waves at the rate of 1,090 feet per second, and water at the temperature of 60°F. expedites sound waves 4,708 feet per second. Iron or steel wire, and wood running with the fibers conduct sound waves nearly four times as rapidly as water. Thus it becomes apparent that a minimum sound can be transmitted in water or through the materials mentioned, a far greater distance than air. The cause of this is that the sound wave is not held together in air, and loses in volume as it travels along, falling short before reaching its objective points.

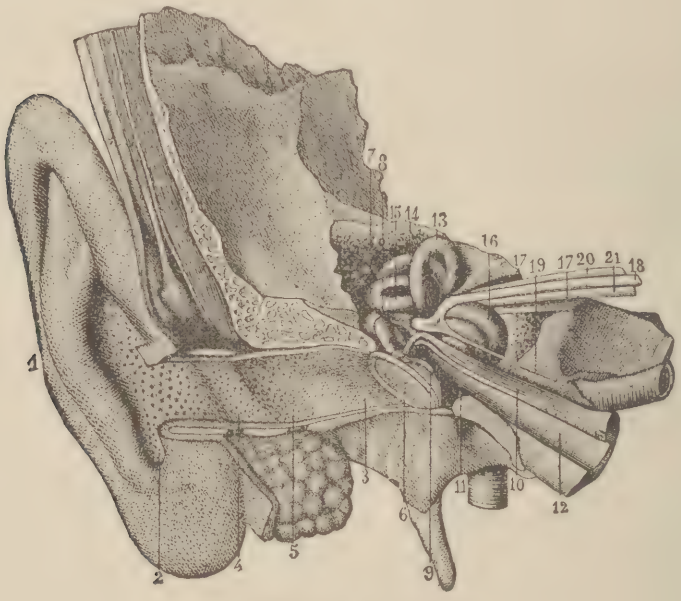
The use of metal wires in conducting sound waves, with the aid of electric or galvanic current as exemplified in the useful, but oftentimes annoying telephone, is too well known to the intelligent reader, and it would also be out of place in this work to recapitulate the physical laws governing this wonderful instrument.

Sound may be deadened by soft and non-vibrating surfaces so well explained by the use of carpets, hangings, etc., etc. Sound waves may also be collected to a focus which explains echoes and the conduction of sound through speaking tubes, ear trumpets, etc. These are of course artificial apparatus, and we cannot see any good reason why they should be used as an illustration of the condensation and conduction of sound waves when we have on the human body an apparatus par excellence for this purpose.

The ear is the organ of hearing, of which the engraving below gives an accurate illustration, which, together with its anatomical description, will explain how vibrations, may they be produced by whatsoever means, are collected by the outer portion of the ear, and conducted to the seat of the sense of hearing. There

these sonorous vibrations are first analyzed, and then comprehended.

It is thus that in conjunction with our other senses we commune with our surroundings.



Engraving No. 21.

The Ear.

1. Pinna.
2. Cavity of Concha.
3. Auditory Canal.
4. Angular Projection.
5. Opening Ear Wax Glands.
6. Tympanic Membrane.
7. Incus.
8. Malleus.
9. Handle of same.
10. Tensor Tympanic Muscle.
11. Tympanic Cavity.
12. Eustachian Tube.
13. Superior Semi-circular Canal.
14. Posterior Semi circular Canal.
15. External Semi-circular Canal.
16. Cochlea.
17. Internal Auditory Canal.
18. Facial Nerve.
19. Petrosal Nerve.
20. Auditory Nerve (vestibular branch).
21. Auditory Nerve (cochlear branch).

The *Ear.* For convenience of anatomical description, this complex apparatus of audition is usually divided into three parts. In order to correctly appreciate its physiology, a brief delineation of the anatomical components is necessary.

1. The *External Ear.* Reader, look at one in

nature. Your own conception is better than the minutest description.

That portion which projects from the head is called the *pinna* or *auricle*. By it the sound waves are gathered. The outer border of the pinna is called the *helix*. The deep fossa immediately surrounding the *auditory canal* or *meatus* is called the concha. The small lobe projecting and covering the anterior surface of the concha is the *tragus*. The fleshy lower portion is the *lobule* of the ear.

The *muscles* of the external ear, while well developed and in abundance, cannot be said to be under the control of the will, as is the case in some of the lower animals, who move with such facility their external ears, to better catch the sonorous vibrations.

The *Auditory Canal* or *meatus externus*, conducting the waves of sound as gathered by the pinna toward the internal ear, extends from the concha to the tympanic membrane or ear drum, and measures in its tortuous line about one and one-quarter inch in length. At its beginning long, stiff hairs are found, and farther in are the *ceruminous* glands which secrete the ear wax. This wax is apparently intended to protect the ear from invasion of, and lodging therein, of insects to the majority of which ear wax is a deadly poison.

The office of the external ear as above described is solely the collection of sound waves and the conduction of same to the ear drum.

2. *The Middle Ear* presents a narrow cavity of irregular shape between the external ear and the labyrinth, and is situated in the substance of the petrous portion of the temporal bone. The outer wall of this cavity is formed by that important organ called the *tympanic membrane* or *ear drum*. It sets obliquely and at an incline of 45 degrees against the auditory canal. In its natural position the membrane is drawn inward by its attachment

to the malleus in such a way as to present a funnel-shaped depression. The roof of the tympanic cavity is formed by an exceedingly thin plate of bone. The floor is of like material, but much narrower. Situated within this chamber is the "*Chain of Bones*," which consist of three ossicles, joined to each other by their extremities, and form a zigzag line of jointed levers across the cavity of the tympanum. These little ossicles receive their names from their shape, and are known as *malleus*, or hammer, *incus* or anvil, and *stapes* or stirrup. The handle of the malleus is adherent to the ear drum, while the head of it lies comparatively free within the cavity, but held in place by small ligaments which at the other extremity are attached to the bony walls.

The cavity of the tympanum communicates with the pharynx through the *Eustachian tube*. The existence of this tube secures an atmospheric pressure, in connection with the meatus, on both sides of the tympanum, a condition necessary for a free vibration under impulses of waves of sound.

From actual observation, and from unquestionable testimony in the possession of the reader, it must be apparent that the tympanic membrane or ear drum is of much importance in audition. Then we all know, that when this membrane becomes diseased, perforated, destroyed or obstructed through an accumulation of ear wax or other substances, the acuteness of hearing becomes considerably affected. This is due to the impaired condition of the vibrating surface for the reception of waves of sound, which is the main function of the ear drum.

The tympanic membrane obeys the laws of consonance and vibrates strongly by the influence of sounds in unison or in harmony with the fundamental tone.

The *chain* of *bones* or *ossicles* of the middle ear, in connection with the muscles therein, have a double office. One is that the ear drum may be brought to different

degrees of tension, and the other that the bones of hearing conduct sounds to the labyrinth.

3. *The Internal Ear*, oftener however, called the *labyrinth*, on account of its complicated cavities, is situated in the petrous portion of the temporal bone. As shown in the engraving it consists of the *vestibule*, three *semi-circular canals* and the *cochlea*.

The *vestibule* is the central apartment of the labyrinth, which communicates through the oval window with the tympanic cavity. When in action this aperture is closed by the base of the stirrup bone.

The *semi-circular canals* are as shown on engraving No. 21, while the *cochlea* is that snail shaped spiral canal, in nature about 1 1-2 inch long and about $\frac{1}{16}$ of an inch in diameter at its commencement, and gradually tapering to the point, making in its course a little over two and a half turns.

The interior of the labyrinth is filled with a certain quantity of clear watery fluid. That part which is contained in the vestibule is called *endolymph* and that in the canals and cochlea *perilymph*. The purpose of this fluid of the internal ear, is to hold in position the delicate structures contained therein, and also to conduct the sonorous vibrations to the terminal filaments of the auditory nerves.

The *Auditory Nerve* enters the labyrinth and divides into two branches, one for the vestibule and the other for the canals and cochlea.

The distribution of the nerve fibers in the cochlea is of the greatest interest; they lie embedded within the minute bodies of Corti. They receive the sonorous vibrations as they pass along in the liquid, and conduct them to the auditory nerve, from whence the sound is transmitted to the brain, the origin of the auditory nerve and seat of the sense of hearing.

In summarizing the mechanism of audition, we only

desire to briefly recapitulate the functions of the different parts of the ear.

The waves of sound are collected by the outer appendages, constituting the external ear, and are conducted through the auditory canal to the ear drum. The last mentioned organ receives the waves of sound and is thrown into vibrations. The tympanic membrane, by increasing its tension, as previously explained, regulates the intensity of sound. While the tympanum is drawn taut through the muscles of the middle ear, the chain of bones is also made more firm as to its articulation and the innermost of the bones, the stapes, pressed against the liquid of the labyrinth. By this continuous bony conductor, the sonorous vibrations are brought to the labyrinth, with very little loss of intensity.

The vibrations repeated and somewhat modified by the tympanic membrane, are conveyed by the chain of bones to the liquid of the labyrinth and by this fluid to the terminal nerve filaments of the auditory nerve.

Sound may also be conducted to the terminal nerve fibers, through the bones of the head or teeth, as is shown by the simple experiment of placing a tuning fork in vibration, in contact with the head or between the teeth. The dentaphone, so extensively used by people partially deaf from injury to the ear drum, is based upon this principle.

While injury or rupture of the ear drum does not constitute positive deafness, it diminishes the power of hearing. Complete deafness can only be caused by paralysis or inactivity of the filaments of the auditory nerve itself.

CHAPTER XIII.

HYGIENIC TOPICS.

HOUSES.

No family has a right to expect to be in full health unless it has been ascertained that the dwelling occupied by it, is, in the strict sense of the word, one in which well known rules of sanitation have been followed in the selection of the ground, mode of erection, dividing its interior, its plumbing, ventilation and general management.

When building or renting a house, see to it that your future abode is not on low, damp ground, or which has been lately filled up. Houses built on soil saturated with putrid moisture, or the residue of cesspools, are notoriously unhealthy. This is especially the case during the summer months, when the ground emits deleterious effluvia and poisons the air you inhale, while in the house.

If possible, the building you occupy should be free at least on two sides, so that the sun has a chance to throw its invigorating rays upon it. Do not fear to open the windows when the great illuminator is around, and do not dread that your carpet or upholstery will be off a shade or two from the prevailing color. Faded carpets and furniture are preferable to faded health.

Crowded tenements and sky-scraping apartment houses, for the poor and fashionable respectively, are breeding grounds of disease. Avoid them. Windows and doors opening upon a court or narrow alley are of not much value, for the reason that the air entering from those places is usually more or less contaminated, and has not undergone the rejuvenating process, as has air in open streets and roadways, where the free current and wind effect a continual change.

The interior of a dwelling should be so arranged that air under all circumstances, and sunlight, if possible, can penetrate into every niche and corner, so that when you open front and rear doors or

windows a new current of air can sweep through it and fill the house with "oxygen," the quintessence of life.

The plumbing in a building should be the best, or none at all. Every cent saved on plumbing will cost a thousand fold in doctors' and druggists' bills. See to it, if you have water closets in the house, that the traps are in good order; that the sewage leaving the building passes through traps, and that sewer gas arising from the street conduits are led by separate pipes beyond the roof. Sewer gas entering buildings through soil pipes is dangerous to life.

Ventilate your rooms daily, winter and summer, and especially those which are used for sleeping apartments. During night allow part of one or two windows to be open without causing a draught, so that the air is changed at all times. By doing this you will be rewarded upon awakening with a clear head and an invigorated body and mind. If you sleep in a closed room where air is debarred you will perceive a dullness in the morning which likens to the awakening from a debauch.

The ceilings of the heavens are high, surely for a purpose; hence follow the example set when erecting a dwelling.

If cellars are not ventilated they become storehouses for foul air, and transfer the same to the living apartments.

Keep your yards clean, and pay especial attention that your back alley is not made a general dumping ground for all the garbage of the neighborhood. Do some kicking, so that the scavenger knows you are after him. If you live in a place where such matters are not attended to by the authorities, have it done or remove the accumulations of dirt and filth yourself.

WATER CLOSETS AND OUTHOUSES.

The existence of these receptacles for the deposit of the excrements of the body is a necessity, but to have them in the building, and perhaps ext to the sleeping apartment, is only one of the so-called modern improvements, contributing to comfort, health and disease. The comfort is too evident and need not be spoken about. As a contributor to health, persons using them are not usually subjected to draughts, to the exposed parts, as is the case when open vaults are used. Thus, among other diseases, sciatic rheumatism is often prevented.

If indoor water closets are however not properly kept so that the excrement is instantly carried off and the hopper thoroughly flushed or allowed to emit odor, they become hotbeds for the propagation of numerous diseases. Dysentery, cholera and other abdominal troubles can be traced to filthy and falsely constructed water closets.

Outhouses with open vaults should be emptied at least four times a year; these vaults should be constructed of masonry and thoroughly cemented so that seepage will not contaminate adjacent wells. This is especially necessary in sandy or gravelly ground.

Outhouses connected direct with sewers are as bad as the "valley of death." Persons using them inhale not only the effluvia of their own excrement, but also the poisonous gases of the sewer.

The best form of privies where there is no system of waterworks, are the "earth closets" in which the receptacle for the fæcal matter is portable and can be removed and emptied at places where it is beyond harm. Whenever the closet is used the deposit should be covered by a small shovel full of road dust or ashes. This will deaden all smell.

In many places where sanitary laws are a mere ornament on the statute book, it can be observed how much is often done by the occupants of a dwelling to render its immediate vicinity unhealthy and a breeding ground for disease. Many good housewives, often unintentionally or through ignorance, throw the slops and accumulations of night vessels simply into the back yard. There it accumulates, and remains from year to year The organ of smell becomes used to it, and the stench is not noticed much. The ensuing putrefaction develops vapors which cause disease.

DISINFECTION.

In houses of all descriptions and used for all purposes, odors and vapors are formed, which if continually inhaled, are injurious to health. These vapors and odors hold in suspense bacteria or particles, which constitute the seed of numerous diseases. To destroy or eliminate these bacteria is the office of disinfection.

Ventilation, sunlight and the combustion of fuel in open fireplaces aid greatly, but not sufficiently, in the purification of the air and we must be suspicious and resort to further means, to be sure that the atmosphere is entirely uncontaminated. Hence the use of artificial media, for disinfection is necessary.

To enumerate all the articles used for disinfectants would fill a very large book, in fact one of greater volume, than the good old fashioned "family Bible."

Exhaled air charged with carbonic acid is best removed by simple ventilation.

Dry air, such as is created in rooms by hot air furnaces, steam coils, etc., should be moistened by evaporating water within the room.

Sewer gas, entering rooms through soil pipes, or through defective plumbing is best got rid of by opening all windows.

To purify the air when charged with illuminating gas, or coal gas from stoves, open the windows.

For sewers, outhouses, barns, open drains, kitchen sinks, vaults, etc., throw in sufficient copperas (first dissolved) to abate the odor.

Open vaults can well be regulated by covering the excrements with road dust or ashes.

In sick chambers, especially if just vacated by patients having been confined therein with contagious diseases, the burning of roll sulphur is an effective disinfectant.

Care should be taken how sulphur is used, but if handled in the following manner, it is entirely void of danger:

Place in the room to be disinfected, as near as possible in its center, a few bricks or stones, and on these an old iron pan or tin plate. Close all windows and doors tight, ignite the sulphur at one end of the stick, place it hurriedly on the receptacle as above described and leave the room at once, taking care not to inhale any of the sulphuric fumes. Close the door behind you and allow the fumes to penetrate into every part of the room. For this purpose the room should be kept closed for at least one or two hours. After that open all windows and doors, so that the vapors can escape, and fresh air enter. Rest assured that all microbes and germs of disease are thoroughly destroyed after this procedure.

When the sick chamber cannot be thoroughly ventilated and disinfectants have to be resorted to, the numerous chlorides on the market can safely be used with good effect. Directions usually accompany these preparations, but one of the best modes to use them, is to saturate a cloth in the fluid and to suspend it in the sick room.

Chamber vessels and bed urinals should always be cleaned with water and common washing soda. If sediments have already formed, leave hot water with soda in them for awhile, which will dissolve and remove the matter. Bedclothes should be thoroughly aired and sunned every day.

The value of carbolic acid as a disinfectant is very much overestimated. It does not destroy odor, but only overpowers it, by its own. It has not any destructive powers in its own vapors for bacteria when used as a disinfectant. When properly used as a remedial agent, its virtues are par excellence. Numerous domestic devices are used to disinfect rooms and vessels, such as burning a rag or exhibiting the smoke from roasting coffee. By resorting to these means you will attain your object, but it is like going from

St. Louis to New York via San Francisco. Think for a moment when you perceive a bad odor in your room, and you try to quell it by burning a rag or some paper, or put some vinegar on a hot shovel, surely it will cause as bad, if not a worse smell, than the original one. To rid the room of the smoke or vapor of the vinegar respectively, you will open the windows, secure a new supply of fresh air and give the credit for the improved atmosphere to the "disinfectant" you employed, and not to the air, where it properly belongs.

Any minor matter or effluvia, if not the result of contagious disease, is best disinfected by means of fresh air and sunlight.

WATER.

Pure water consists of Hydrogen and Oxygen (H^2O) and is a colorless, odorless, tasteless, transparent liquid. It is the most important solvent in existence. It is in fact an essential ingredient in the tissues of all animals and plants; in the human body about two-thirds of its weight is water; (70 per cent. is perhaps the closest calculation.) It is abundant in the blood and secretions to give them fluidity and to enable them to perform their functions. It is, as you have learned in preceding pages, that through the blood, new substances are introduced into the body and old, worn out ingredients discharged. Water is therefore necessary for the introduction of solid substances, for the reason that they must be liquified before assimilation can take place. The importance of water in its character as an essential part of the animal fluids is therefore evident, especially so, when it is remembered that it holds in solution the nutrient substances, which are thereby enabled to pass and repass throughout the entire human system.

The water which thus forms a part of the human body, is derived mainly from the outside. It is taken in the form of drink, and is also in abundance in the various foods. No article is taken in an absolutely dry state; all contain some quantity of water.

The proper quantity necessary for proper existence, during twenty-four hours, in a healthy adult man is about five pints.

Water after forming part of the animal solids and fluids and taking its share in the vital processes is discharged again from the body. It makes its exit in various ways, carrying with it and holding in solution various substances, of which the body must be relieved.

Thus the body discharges by way of the lungs twenty per cent. of the amount taken during twenty-four hours. The water leaving the body through the lungs is in the form of vapor, carries with it

carbonic acid and other substances which the blood must be relieved of. Thirty per cent. is carried off by perspiration. The balance of fifty per cent. is discharged from the body in the form of urine and fæces. In the former, the body is relieved of many organic principles which if allowed to accumulate, would cause disease. The water discharged with the fæces, acts mainly as a lubricant of the semi-solid excrementitious matter.

An article having such important functions to perform, should therefore be selected with the utmost care, before it is decided that it is used as an article of drink.

On the purity of water, the health of animal life is more or less dependent, which is especially the case with man.

In cities where public waterworks have been established, care is always taken to select a source of supply which is as pure as it can be had, and in quantities to meet all demands. Should, however, the least suspicion arise that the water so furnished is contaminated, or holds organic matter in solution or suspense, care should bs taken to filter the water through sand or filtering stones, or to at least boil it before it is used as the natural beverage. Impure water is easily detected by observing whether it possesses the cardinal principles mentioned at the beginning of this paragraph.

Clear, pure water, free from every substance foreign to it, is not found in nature, and can only be gained by distillation. Next to it comes rain water, so much used in certain localities. Its apparent taste is flat and insipid, owing to the absence therefrom of salts and carbonic acid.

Water containing more than four per cent. of salts in solution is already classed among medical agents.

Hard water is rich in salts; soft water has little or none of these ingredients.

Rain water is pure and healthful, but not to the taste of the majority. If it stands in cisterns it is liable to be contaminated from neighboring sinks or vaults.

Spring water is the best, usually of the proper temperature, especially when it oozes from sandy or rocky ground.

Well water is often a wolf in sheep's clothing, having been contaminated by seepage from cesspools, sinks, privy vaults or manure piles. Look out for it, it may be cool, clear and not objectionable to the taste. When you have to use well water continuously, it will pay in the long run to have a chemical analysis made, to ascertain whether it contains substances detrimental to health. If you are

the least suspicious as to its character, boil it at all events before using it.

River water is often a good article, and perhaps the next best after spring and lake water. If it is known, however, that it receives the sewerage of neighboring cities and villages, above from where you draw your supply, it is liable to be bad. It had better be boiled before using it.

Water from *ponds* invariably needs filtering; boiling will hardly put it in a fit condition for use.

Ice Water. When this peculiar American drink is taken into the stomach, it has to be stored there for such time until it assumes the temperature of the body, at the expense of the rest of the tissues, before it can be absorbed and taken up by the blood. It is erroneous to think that it slackens thirst, for its chilling effect upon the mucous membranes which it passes in its descent to the stomach, and also therein, creates a submucous inflammation, which causes further demand for cooling drink. You can experiment on yourself, by taking a drink of iced water, and in a very short space of time you will have a burning desire for another dose. If taken in connection with meals, it hinders digestion by chilling the coats of the stomach, and interfering with the production of gastric juices.

Dyspepsia, so prevalent in this country, is in many instances traceable to the free indulgence in iced water.

The less you take of it, the better you will feel.

CHAPTER XIV.

MISCELLANEOUS TOPICS.

BEAUTY.

Wordsworth says: "Beauty is the production of a multiplicity of symmetrical parts, uniting in a consistent whole."

There is no better personification of beauty than can be found in the "human form divine," in its complexity of color, form, symmetry, parts and last but not least, the mind.

The human model is used by both painters and sculptors, in their greater efforts, and many have been immortalized by portraying the natural beauty of body and mind, of men and women.

The ancient Greeks and Romans deified beauty and produced images of the human form, both male and female, which to this day are preserved in European galleries, and are considered as reproductions upon canvas and in stone, of the perfect human form. The statues of the Apollo Belvidere and the Venus de Medici are standards of beauty in their respective spheres.

Beauty attracts, homeliness detracts. The former brings adoration, while the latter lays dormant the passions. Beauty of mind and of body do not always go hand in hand, and each has its special attraction, while combined they contribute to the limits of happiness. Many, however, reach this apex by a congeniality of mind only.

Beauty is easily developed by physical and moral training.

A work of this kind should not meddle with matters beyond its scope, and for this reason we refrain from speaking on the development of the mind through moral training.

PHYSICAL TRAINING.

To attain symmetry and bodily development, exercise, in its multitude of ways, must be resorted to.

Walking. Everybody who can do so should accustom himself or herself to practice it. Walking in the open air is of course preferable. It increases respiration, circulation, secretion, and

fosters, in consequence, the replacement of decaying tissue with new element. In taking this healthful exercise, one should walk in the full sense of the word, not dawdle along in a sauntering manner. Deep inspirations of air should be taken, chest well brought out, head carried erect. In order to occupy the mind during a walk, the eyes should be used in taking within the range of vision such objects as may be of interest. The staring upon the ground breeds melancholia. A good square walk, combined with a communion with nature, is a restorative to body and mind. It develops the muscles of the lower extremities, and of respiration, and imparts a healthy glow to the face.

Horseback Riding. For those who can afford it, a better exercise cannot be recommended, as every muscle in the body is brought into action, especially when the horse is made to trot.

Gymnastics of all kinds contribute to beauty and health. Care should be taken that the practice with dumb bells, Indian clubs, rowing, parallel or horizontal bars is not carried to excess. The object of all athletic exercise is to make the muscles and cords pliable and elastic, but not to tire them.

Swimming is not only a healthful exercise, but also an accomplishment, when once acquired, and of much utility. No child, boy or girl, should grow up without learning to swim.

Many good people imagine that there is no need of physical training by means of gymnastic exercises, because they are new ideas to them and were not in vogue in their youth. Such non-progressive people should remember that the avocations of life in their days were not made so easy by aid of the many labor saving machines as they are now, when steam created by fuel and water does the hard work, and brain power guides it. That healthful exercise, combined with usefulness in the manipulations of a buck and saw, seems to be one of the lost arts.

A due appreciation of the importance of physical exercise and its bearing on the development of the body should be instilled in every one. The good results from it can best be judged by glancing at those who participate in the many legitimate sports.

This well meant advice is not only for the young men, but also for the girls, than nothing will aid them better in their destiny—mothers of homes—than a well developed body.

WASHING AND BATHING.

It is instinctive with the majority of people to take a good wash or bath, and there is perhaps nothing which contributes so much to health as cleanliness.

Washing or bathing the body is as necessary to its existence as food and drink. If the skin is allowed to become filthy, its proper action as an organ of excretion is interfered with.

AMUSEMENT.

Amusement is recreative if legitimate; hence the theater, when in it, one of the grand old plays is given, or a mirth provoking, clean and moral comedy is performed, should not be considered as a soul-destroying medium. A good hearty laugh, or the shedding of tears, in comedy and drama respectively, have often forestalled diseases of the mind, and led the channel of thought in directions beneficial to the body. Good music either at home, at the church, concert halls or under the great heavenly tent contributes much to recreation and charms the mind; the oftener you hear or participate in it, the better you will be satisfied with yourself and surroundings.

> "The man that hath no music in himself,
> Nor is not moved with concord of sweet sounds
> Is fit for treason, stratagems and spoils."
>
> —*Shakespeare.*

OCCUPATION.

In choosing the avocations of life, the main participant should always be consulted as to his or her predilection. Many a young man or woman would have contributed much to their own welfare and that of others had they not been interfered with in the selection of an occupation. If the natural ability of a young man is in the mechanical line, he should not be forced to study for a profession, and vice versa. Water will always find its level; so will the talents in the human being, if allowed to develop, with the aid of proper education.

Everybody has and needs occupation, even the laggard; (he occupies his mind with thoughts and hallucinations which are more bother to him than real work would be.) There is an old proverb that says, "Who not works, shall not eat." In this is a principle of law, which rules organic life. It holds good in every sphere of occupation, whether mental or physical, as in either the different organs of the body participate and show their activity.

It is erroneous to think that while in a state of health if we do not use our organs in some sort of avocation, that they will be preserved. Take for instance your brain, and not use it at all, and it becomes next to corroded; your ideas lose their broadness, nor can you grasp the most simple question of the day. It is necessary to keep your

organ of sensibility in activity, unless you wish to be numbered among those who have their thinking done by others.

If your nerves are subjected to irritation they become blunted. The muscles, if not properly used, become soft and waste. A lazy man or woman is only half a human being. Through the many theories and observations on the laws of heredity, one can learn that weak parents produce weak offspring; strong ones as a rule have healthy children. This is not only recognized in the human family but even the intelligent stock raiser, who hunts the world over for strong progenitors. If, then, these theories are adopted and used with good results, why should the human family not take heed and avoid laziness and consequent decay of body, soul and pocketbook, and thereby contribute to their own misery and that of their descendants.

Labor must not be continuous, but an interchange between work and rest. The latter we receive by diverting our minds from our occupations to some other channel and through sleep.

SLEEP.

In contemplating for a few moments upon this natural and healthy, but temporary and periodical modification of the functions of the organs of sense as well as those of locomotion and execution, few consider that this period occupies about one-third of our existence. During healthy sleep we are in a more or less unconscious state, and are not under mental control. Our acuteness of mental perception is lessened. Repose is a necessity as much as proper exercise is for the nutrition of the muscular system. Fatigue can be relieved without sleep, but after prolonged and severe mental exertion, or after long continued muscular exercise involving the expenditure of nerve force, sleep becomes an imperative necessity. The nervous system can, however, be driven and excited to such extent that sleep does not follow.

The body makes its want for sleep known only after moderate activity, in which case sleep is a natural consequence. If the body is driven beyond the limit, either mentally or physically, and is robbed of needful sleep, insomnia will manifest itself. This is a predisposing cause of numerous brain diseases.

During the early years of life sleep seems to be of great importance, for the reason that this period is one in which the body is more readily developed. The baby does little else but sleep, take nourishment and digest it. Adults while in perfect physiological condition, need about eight hours of sleep. This rule if it may be

called such, is subject to variations and usually each individual learns by experience how much sleep is necessary for him in order to keep in perfect health.

Of all things necessary to the human system, nothing incapacitates it for mental or muscular effort so much as to be deprived of sleep.

As far as it is known, the brain is in a condition of absolute repose, at least so far as mental operations are concerned. This is caused by a diminished supply of blood to the cerebral regions. Practical experiments have been made upon the lower animals as well as the human, by compression on the carotid arteries, and thus lessening the flow of blood to the brain.

It is also a well-known fact, that after the ingestion of a full meal, the person feels drowsy. This is caused from the determination of the blood to the digestive organs at the expense of the brain. During sleep all the functions except those under the control of the sympathetic nervous system are diminished in activity. Circulation is slower, pulsation not as rapid, and the respiratory movements are not so frequent. In regard to digestion, secretion and absorption during sleep, little positive information is at hand and physiologists have so far failed to demonstrate to a certainty, whether the activity of these last mentioned functions is diminished, normal or increased.

Prolonged exposure to extreme cold induces sleep, and if the person loses the power of resistance to somnolence, and the cold be not rapidly diminished, death is the inevitable result.

Quietness in surroundings is favorable to sleep, and to some persons a positive necessity, thus we find the inhabitants of the quiet rural districts have difficulty in going to sleep in noisy cities. Again, the people living in noisy cities, or those who have to get their sleep on railway trains, become so used to it that they find trouble in going to dreamland, when surrounded by serenity and stillness.

DREAMS.

During sleep we receive no impressions from the external world. Still ideas, many of them preposterous, may be generated during sleep in the brain, from impressions which found lodgings in our seat of senses while awake.

> "Sober thought pursued the amusing theme,
> Till fancy colored it and formed a dream."—*Pope.*

Mental operations may take place during sleep, of which we have consciousness after awakening, but the recollection of these fades rapidly, unless we make a special effort to implant them upon

our memory. Socrates compared the remembrance of ordinary everyday dreams, with the impressions made by a seal upon a running stream. It was made, but vanished with equal rapidity.

Dreams are mostly due to a disorganized digestion or stored up hallucinations in the brain. Others however, argue with a good deal of force, that dreams are produced from external impressions during sleep and then form perversions in the brain entirely disconnected with the impression made.

Sleep accompanied by dreams is not as refreshing as normal sleep, during which our mental machinery is dormant.

Frequent dreams are no doubt detrimental to a general well being, and are when demonstrated through the grinding of the teeth, talking, crying, or even getting up and walking around as in somnambulism, signs of nerve irritations, bordering on a pathological state.

LIGHT.

When man is born, the first perception of existence is through light, and with it life of the body begins its existence.

"O spring to *light*, auspicious babe, be born."—*Pope*.

Life is closely intermingled with light, and so necessary to our existence, that whenever life is extinguished, the material body is not obvious to light. Where there is light, there is life, and we can perceive our surroundings.

When we speak of the material light, we can only say that it is a force or action in nature by the operation of which upon the organs of sight, objects are rendered visible or luminous. Light was formerly regarded as consisting of material particles, traversing space, but now it is generally understood to consist in the propagation of vibrations or undulations in a subtle elastic medium, set in vibratory motion by luminous bodies, similarly as the atmosphere is by sonorous bodies. This view of the nature of light is known as the undulatory or wave theory, while the transmission of material particles, was named in honor of its propagator, the "Newtonian" theory.

Light travels at an incomprehensible rapidity, its waves getting through space at the rate of 192,000 miles per second.

HABITS.

Habits in persons may be either natural or acquired, and are in both cases generally firmly fixed, and when not combated, are just as firmly retained. A good many habits contribute to our moral and

physical well being; like the habit of a ladylike or gentlemanly behavior. Others find much consolation in a retired habit, while another class have an acquisition in their make up which has grown into a jovial habit, "Hail fellows well met." Persons blessed with the latter habit, if the exposition of joviality is within correct bounds, add much to the enjoyment of life in themselves and others. Some habits are costly, some of these do good, while others do not. Of good habits we will not speak, for we believe the more we have of them, the better for all. But there is a trio, which need a bit of ventilation; they are hard rooted, and should be corrected. The ban which society has placed on *Opium*, *Treating and Tobacco* seems to do but little good. They are persisted in, and these articles and the debasing fashion so much in vogue as to treating, are rather on the increase, to the detriment of the well being of those who practice these habits.

Treating is a habit, which needs condemnation. We refer only to the strictly American practice of treating, in the shape of asking an acquaintance to step into a drinking place to "*have something.*"

"Treating" is unknown in any other civilized country, and how it has secured such a foothold in this land is unexplainable. Through this treating business more full-fledged downright drunkards are made than any other avenue. If a man must have strong drink and cannot do without it, he should not force others to partake of it, under the guise of an overflow of friendship, and thus assist his fellow man along the down grade.

Anti-treating societies would contribute as much toward true temperance as total abstinence.

Opium—Is the great alleviator of bodily pain, and also the great destroyer of the human mind and body. As a remedy in the practice of medicine it is perhaps one of the most valuable of all the therapeutical agents. But the conscientious physician will only use it when imperatively necessary. The use of this drug in the shape of a soothing syrup, as is used so much to quiet babies, we brand as a crime.

Opium is obtained by incisions made in the capsule of the white poppy plant, from which a white fluid flows. After drying on the capsule it is removed and this product is the raw opium of commerce. In color it is brownish yellow, has a faint smell and a bitter acrid, taste.

Opium is a narcotic poison, producing hallucinations of an indescribable character, profound sleep and if taken in larger doses causes certain death.

Opium is dispensed in many forms. Laudanum is the fluid tincture. Morphia is the alkaloid of opium, and is the chief narcotic principle in it.

The opium or morphine habit is easily acquired, sometimes through the physician, but in the majority of cases, the drug is taken without medical advice, to relieve real or imaginary pains, and very often through curiosity tor find out its effect.

As a thorough destroyer of body and mind, it has no superior, and while not an associate with alcohol is about on a par with it. The user makes himself a slave to the drug. Many people shun whiskey and its kindred, and look upon these articles with the utmost horror, but seem to have no compunction whatever to take their regular debauch in opium or morphine. While the effect of alcohol is hilarity often accompanied by demonstrations of physical power to the detriment and injury of innocent women and children, opium tranquilizes the partaker and transfers his mind to the lost garden of Eden, only to be deceived upon awakening, that he or she is the sole proprietor of a terrible headache and are anxious to return to the dream. The craving is established, the mind is weakened, the unfortunate has lost all interest in wife, children, friends and others who were formerly dear to him, he does not care whether his dependents have clothes to wear, or bread to eat, provided his insatiable appetite for this seducing drug is satisfied.

The habit once well established usually continues and well authenticated cures are very rare.

This is so much more reason, to guard against forming a taste for opium and morphine.

Tobacco. The habit of using tobacco among civilized and certain uncivilized people is universal, or at least nearly so. It is tolerated to a certain extent and is in a measure the least objectionable.

Tobacco is a poison, as is evidenced by the using of the first pipe of tobacco, cigar or a cigarette. The sign of this poisoning is acute and shows itself through nausea, vomiting, diarrhœa, weak pulse, difficult respiration, dizziness, tendency to swoon and shaking of the limbs. The poison causing these pathological exhibitions, is the active principle in tobacco: *Nicotine*, a poison which challenges its brothers and sisters in virulence. The quantity produced from one pipe full of tobacco or a cigar may not be sufficient to cause death, even if all the nicotine therein were absorbed in the system, but it creates within the body a decided necessity, which calls for subsequent doses. The venture is then repeated, again and

again, till the existence of the poison thus inculcated into the system becomes absolutely requisite. When this stage is reached the habit of using tobacco is firmly established. The danger of being fatally poisoned by nicotine is less in the user of tobacco than in those unaccustomed to the weed. As vaccination is a safeguard against small-pox virus, so is the gradual use of tobacco against nicotine poison. In contemplating for a few moments, why we smoke, chew, or take snuff, the mental machine evolves many causes. Some will say, it soothes and tranquilizes the nerves. Yes, they are right; other narcotics will do the same, and all at the expense of the body, and especially the nerves. Others will say, my grandfather lived to be nigh unto ninety years old, and smoked on the day of his death. All these reasons are without foundation. Then science as well as experience shows that by using tobacco we fill our bodies with a poisonous substance. It may affect some more and some less, but real good to our health or surroundings cannot be found in the use of the weed. The worst form of using tobacco is doubtless the smoking of cigarettes, and when a cigarette fiend is asked what good it does him, it is usually found that his mind is already so far gone that he cannot concentrate it sufficiently to see for himself, that by inflating his lungs with the poisonous smoke he hastens his journey to the grave.

ALCOHOL.

These topics would surely be incomplete, if the reader's attention had not been drawn to the article heading this chapter. While we do not desire to enter into the great moral and social question of the day connected with the use and abuse of alcohol, the necessity must be apparent, that the character of this fluid should be better understood. To this end, the mode of manufacture, its constituents, its effect on alimentation, respiration and its destructive qualities of animal tissue, from a purely physiological point of view, are deemed of sufficient interest. It is hoped that the hints thrown out throughout this treatise on alcohol will serve as a guidance in the use of the article.

Nearly all people upon the face of the earth, since time immemorial, have had access to alcohol in some form, and have and are still using it. Whether this be in order to meet some want occasionally felt by and peculiar to the human organism, is a question upon which physiologists have found it impossible to agree.

All distilled and fermented liquors and wines contain a greater or lesser quantity of alcohol. The whole category of alcoholic

beverages would be as innocent as pure water, were it not for the presence in them, of alcohol.

The percentage of alcohol in the more common, everyday, beverages varies very much. On it depends however, the intoxicating power and as the use of these liquids, especially when excessively indulged in, is of a serious nature, its influence upon the human system has become an absorbing question in nearly all walks of life.

PROPORTION OF ALCOHOL IN LIQUORS, ETC.

NAME.	PER CENT. ALCOHOL.	MADE FROM	ALCOHOL DEVELOPED	REMARKS.
Common beer	2	Barley and hops	Fermentation	Bitter sweet
Cider, hard	5-9	Apples	do	Sour
Porter	3-5	Barley and Hops	do	Bitter sweet
Ale	6-10	do	do	Acid bitter sour
Rhine wine	7-8	Grapes Nat.	do	Acid
Moselle do	8	do	do	do
Elder wine	8	Elderberries	do	Sweet
Claret	9	Grapes	do	Tannic sour
Gooseberry wine	12	Gooseberries	do	Sweet
Champagne	12-14	Grapes	Bottle Fermentation	Effervescent sweet acid
Sherry wine	17-24	do		
Port wine	23	do	Fermentation	Sweet
Malaga	17	do	do	do
Currant wine	20	Currants	do	do
Madeira wine	22-27	Grapes	do	do
Raisin wine	25	Raisins	do	do
Gin	47-51	Rye malt and Juniperberries	do Distillation	do Juniper burning
Brandy	53-55	Grapes	do	Grape flavor pungent
Rum	49-53	Molasses	do	Burning
Irish whiskey	49-53	Grain and potatoes	do	Smoky
Scotch do	50-54	do	do	do
American do	48-60	Corn, wheat, rye	do	Burning
Cologne spirit	94	do	do	do
Absolute alcohol	99^{60}	do	do	do

It will be noticed from the foregoing tabulated statement, that all the stronger beverages are made by the process of distillation.

Distillation. This process is preceded by allowing the starchy substances to transform into saccharine matter, and by adding yeast to the mash through which fermentation is produced. While in this state the mash is placed in the distilling apparatus, from which the alcohol, aided by heat, evaporates. The vapors are conducted through a "worm" which is connected with the kettle, by means of which condensation ensues. The product is alcohol in the raw state. The presence of water in it, regulates its strength. Redistillation increases the percentage of alcohol, and rectification eliminates fusel oil.

Wine is the expressed juice of fruits, such as grapes, currants,

gooseberries, plums, raspberries, etc. When the juice so obtained does not contain a sufficient quantity of sugar, an alcoholic fermentation does not take place, but one which is called an acetic fermentation (souring), the product being vinegar. The alcohol in wine is formed through a natural fermentation, which takes place at a temperature not lower than 60° F. The saccharine matter in the juice is transformed into alcohol and carbonic acid. If the latter be allowed to escape, the product is known as still wine and if forming a part of the wine and being held in confinement within the bottle containing the wine, becomes effervescent and sparkling. Champagnes belong to this class.

Cider is the wine of apples.

Malt Beverages. The process of manufacture of these beverages differs from the foregoing, and is somewhat complex. Pure beer, ale or porter is nowadays about as scarce an article as can well be imagined, and as the brewers keep the mode of making an artificial article to themselves, we can only describe the making of malt beverages as they are supposed to be.

The grain which is exclusively used for the brewing of pure beer, ale or porter, is barley. This is first soaked in water, then piled up, so that germination is forced through heat, by which the saccharine principles are evolved. The grain in this state is dried in a kiln, after which it is ground into a meal. This process constitutes malting.

The requisite amount of ground malt is then placed in a mash tub, boiling hot water is added to it, through which the saccharine matter is dissolved and held in suspense. The liquid, after being drawn off, and which is called *wort*, is then pumped into a kettle where a certain quantity of hops is added to it. This mixture is boiled, and the fluid partakes of the bitter flavor of hops. After the boiling process the fluid is rapidly cooled and stored in vats, in which, through the addition of yeast, fermentation takes place. Through fermentation alcohol and carbonic acid generate. When the yeast has properly settled the fluid is carefully drawn off and placed in large casks to age, a process which improves the quality.

Of all intoxicating beverages, beer, ale and porter contain the least percentage of alcohol.

Alcohol contains the following constituents : Carbon[4], Hydrogen[6], Oxygen[2], and is classed among the non-nitrogenized principles. Sugar and fat belong to the same class, and while these are essential to proper nutrition and undergo important changes in the organism, alcohol is absorbed and taken into the blood but not used in the

economy. It is discharged from the system unchanged as to its constituents.

Alcohol can be recognized in the expired air after it has been taken into the stomach. While its bulk is eliminated from the body by the lungs, the skin and kidneys also aid in discharging it.

Alcohol retards the elimination of carbonic acid, a product which is formed in the regeneration of the tissues and must be exhaled in proportion to the quantity produced in order to enjoy health.

Alcohol also diminishes the quantity of urea to be discharged from the body. A retention of this substance causes a species of blood poisoning.

Alcohol diminishes the activity of nutrition and weakens the assimilative powers of the system to such extent that the proper amount of food cannot be taken. In such cases, alcoholic drink is then craved for, to supply a self-engendered want.

Alcohol in its character as an irritant causes inflammation of the mucous membranes of the system, hence the various abdominal inflammations so frequent in drunkards.

Under ordinary circumstances when the wants of the system can be adequately supplied with food, alcohol is positively injurious. When, however, the quantity of food is insufficient, alcohol may for a brief space of time sustain the powers of the body. The effects of its continued use, not accompanied by proper articles of diet, shows that it cannot take the place of assimilable matter.

Temporary insufficiency of food, great exhaustion of the nervous system and physical collapse may be alleviated temporarily through the administration of small doses of alcoholic beverages, and therefore in the strict sense of the word, alcohol under these and various other conditions seems to be useful, and it is hardly proper that this remedial agent should be utterly condemned. For its legitimate purpose, alcohol is an article "par excellence," which is liable to abuse, and the effects of which on the mind and body when taken constantly in excess, are most serious, and must be regarded as pathological.

Alcohol possesses the special characteristic of arresting fermentation, as is so commonly evidenced in the preservation of specimens. The gastric juice of the stomach being one of the strongest ferments in existence, and necessary to proper digestion, is made useless if it comes in contact within the body with alcohol. Its active principle, pepsin, is precipitated through the exhibition of alcohol, and hence its functions are interrupted if not entirely destroyed.

Albuminous substances, such as the white of an egg, large portions of muscular meat, gluten and many other vegetable articles of diet containing it, are coagulated by alcohol, not only out of the body, but also in it. The albumen becomes permanently altered, and cannot again be rendered soluble, even when withdrawn from contact with alcohol, but only by means which further modify the character of the albuminous substance.

Alcohol in excessive doses or habitually taken in any form paralyzes the vaso-motor nerves, dilates the bloodvessels and increases the pulsation. Its action upon the nerve centers is also paralyzing and the cerebellum specially seems to be affected, as is shown by the loss of equilibrium in an intoxicated person..

Taken in very moderate quantities alcoholic beverages produce a certain amount of nervous exaltation, which gradually passes off, in proportion to the elimination of it from the system. In some individuals the mental faculties are sharpened, while in others they are blunted. In large doses the effects are the well known phenomena of intoxication, delirium, and, in isolated cases, where the quantity taken was excessive, it has caused instant death. The mental exaltation produced by alcohol is invariably followed by reaction and depression, appropriately called "self-inflicted indisposition."

While it is true that alcohol, taken in moderate doses, produces a genial warmth on the surface of the body, it must be borne in mind that it is done at the expense of the internal vital organs, from which the blood has been diverted and brought to the surface. Therefore the old established theory that a good horn of whisky or some hot toddy will fortify a person about to be exposed to the inclemencies of the weather must go down as fallacious, if the testimony of Dr. Hayes, the eminent and scientific Arctic explorer. as well as the writings and sayings of Dr. Kane and Gen. Greeley are to be taken as truthful. Dr. Hayes reports as follows:

"While fresh animal food, and especially fat, is absolutely essential to the inhabitants and travelers in Arctic countries, alcohol is, in most any shape, not only completely useless, but positively injurious. * * Circumstances may occur under which its administration seems necessary; such, for instance, as great prostration from long continued exposure and exertion, or from getting hurt; but then, it should be avoided, if possible, for the succeeding reaction is always to be dreaded; and if a place of safety is not near at hand, the immediate danger is only temporarily guarded against and becomes finally greatly augmented by reason of decreased vitality. If given

at all, it should be given in very small quantities, frequently repeated, and continued until a place of safety is reached. I have known the most unpleasant consequences to result from the injudicious use of whisky for the purpose of temporary stimulation, and have also known strong, able-bodied men to have become utterly incapable of resisting cold, in consequence of the long continued use of alcoholic drinks."

LIFE.

Life is the space between generation and death, and the potential force by which the organs are started and continued in the performance of their several and co-operative functions. Life is the combination of body and soul! The former is the abode for the latter, and the latter the master of the former. Throughout life the body must be used, if we live in accordance with the laws of nature, but we must not misuse it. If we do, we bear the consequences. Through the work of the soul, the body becomes perfect. These are conditions to which we must adhere; deviations therefrom cause disturbances in the body and mind, which not only shorten, but also terminate life.

DEATH.

Death is the condition to which all organized bodies must ultimately be reduced, and implies the cessation of all vital phenomena without capability of resuscitation.

Death takes place in various ways. It is of rare occurrence, however, that a perfectly physiological death takes place, and just as seldom that a strict physiological life is enjoyed. Such lives have been led and such deaths have also occurred, in which the vital forces became exhausted, the active powers gradually deserting each organ, the functions of absorption and secretion having been slowly arrested, circulation seemingly slower and suspended, the heart having ceased to act and death ensued naturally from old age, unaccompanied by disease, with mental and physical apparatus simply worn out from long use. Such is called a physiological death. Death of this kind, as long as this tearing asunder of body and soul, is one of the laws to which we all have to succumb, might be wished for, when our time has arrived, but how often our prayer for such dissolution is granted, is seen, when we observe our fellow beings battle with the grim destroyer during sickness. Death occurs instantaneously as in some cases of accident.

In most instances, however, death is preceded by disease, some lingering and incurable, in which cases death is welcome. In many

cases, and I might say in the majority, when the destroyer of life sends his advance in the form of sickness, the dreaded moment may be postponed through means furnished by nature, and developed by science. Health, the blessing of life, may thus be restored and death defied for a time at least.

This is in a measure the purpose of this work, but how it is done, is beyond the field of the writer, but he is able to assure his readers that his co-laborer in this treatise has studied the art and science of war that must be waged against death, that life may be prolonged, made happier, and shorn of the numerous ailments the human body is subject to.

PART SECOND.

DISEASES;

THEIR SYMPTOMS AND TREATMENT.

BY

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"Our remedies oft in ourselves do lie,
Which we ascribe to Heaven: the fated sky
Gives us free scope; only doth backward pull
Our slow designs, when we ourselves are dull."

—SHAKESPEARE.

INTRODUCTION.

In the beginning of this chapter we desire to say just a word to the readers of this work. It is fair to presume that you purchased it for the purpose of better informing yourself in reference to the structure of your body, the physiological laws governing the same, the diseases to which you are subject, and the remedies for their relief.

You cannot succeed in this by the mere purchase. You must not only read but *study* the work. Now is the time for this. Do not wait until you or your family are sick, but begin *immediately*. As has been set forth in the preface, the aim of this work is as much to *prevent* sickness as to relieve it. See if you cannot obtain from these pages, and fix thoroughly in your mind, one fact each day. Thus, at the end of the year, you will have accumulated three hundred and sixty-five facts. Is not this worth an effort?

When the work is bought for family use, we advise that the parents read it together and exchange ideas by talking it over. It is often the case that some member of the family has a natural taste for nursing the sick, in which event we advise that this natural talent be encouraged and developed.

For the best results follow strictly the rules laid down. "There is no use calling a doctor unless you follow directions," is a common saying and a true one. These volumes are your physician; hence follow his directions.

CHAPTER I.

PRESCRIPTIONS.

A prescription is a written direction for preparing medicine, to be taken into the system with a view to relieving pain, checking and controlling unhealthy action or change in the different tissues, and increasing or diminishing the functions of the various organs and parts of the body.

Besides the naming of the remedy or remedies to be employed, the prescription usually embodies the direction for administering the medicine.

A prescription may contain a single remedy or more. The object of combining remedies is that their action may be modified. Thus two medicines of the same nature combined form a compound which may resemble the originals in its action, or may differ entirely from them.

Again two or more remedies of an opposing nature are combined to produce an action differing from either of the originals.

Medicines in addition to the intended effect very frequently produce disagreeable symptoms which may be moderated or altogether prevented by combination with other medicines. Thus the griping or nausea produced by some cathartic medicine, may be corrected by the simultaneous use of anodynes or aromatics.

Another, perhaps the most important reason for combining remedies, is to meet different and co-existing indications in the same patient. For example, a person not infrequently has debility of the stomach and constipation

of the bowels, connected with an impoverished condition of the blood. To meet these conditions it is requisite that the prescription shall contain: 1. A remedy to give tone to the stomach. 2. One for relief of the constipation. 3. For improving the morbid state of the blood, combined and so arranged as to be taken at the same time.

The reasons for combining remedies might be multiplied, but the above are quite sufficient to show the importance of a thorough knowledge of this subject.

The universal practice in medical works intended for home use is to name the remedies which are employed for different diseases and leave it for the patient or friends to decide as to the manner of preparation and amount to be given. This makes these works practically worthless.

In "*Prescriptions and How to Use Them*," we have obviated this by furnishing in a separate volume quadruplicates of the prescriptions made under each disease, ready to be taken to the drugstore for preparation.

The same prescription will, in some instances, be used for different diseases. When this occurs, the direction should be followed given under the disease for which the remedy is wanted.

The aim of the conscientious practitioner of medicine, since the days of Hippocrates, whether actuated by philanthropic or selfish motives, has been to succeed. In order to accomplish this he must be able to *relieve* pain and disease. This requires *remedies*. To obtain these the kingdoms of nature have been searched. Geology, botany and chemistry have each contributed their share, and out of the abundance many medicines have been discovered which are both *safe* and *reliable*. Of those that have "been tried and not found wanting" we shall choose for this work, and in so doing shall not confine ourselves to any school system or "pathy" of medicine, but advise such remedies as we know from experience to be worthy of the name.

Among the list are some much older than the writer, while others are the result of modern investigation. These prescriptions have been gathered from different sources. Some of them were favorites of our illustrious preceptor. Many were obtained while attending lectures at Toronto University and Bellevue Hospital Medical College, New York, while others were taken from medical journals, both American and foreign. The others are original with the writer.

Thus it will be seen that the collection embraces, not the opinion of one mind, but many, and covers investigations in this line extending into the last century.

Many of these prescriptions are considered "standard" by the profession, which makes this *first* publication of them valuable.

We wish in this connection to anticipate any charge our brethren may make as to "unprofessional conduct" in giving prescriptions at less than "*One-half of a Cent*" each, where the "fee bill" makes the price from fifty cents to $1.50, by stating that we are wholesaling knowledge, while they are only retailing it—a difference of over forty-nine cents in favor of the consumer, and one which we believe will be appreciated not only for the few dollars it will save, but from the hours of suffering that will be prevented by the timely use of these remedies.

"A stitch in time saves nine," is not more applicable to any other line of action than in the treatment of disease. A prompt application of a very small quantity of water will extinguish a fire, which, if left to itself, becomes a conflagration that the best drilled fire department, with all its improvements for fighting fire, is unable to control.

The dose named in the following pages is intended for a grown person unless otherwise mentioned. The following will be found serviceable as a guide for determining the dose for children :

For a child one year old or under the dose should be..... $\frac{1}{20}$ that of an adult.
Two to five years old..... $\frac{1}{10}$ " " "
Five to eight years old..... $\frac{1}{5}$ " " "
Nine to twelve years old..... $\frac{1}{3}$ " " "
Thirteen to sixteen years old..... $\frac{1}{2}$ " " "
Seventeen to twenty years old..... $\frac{3}{4}$ " " "
At twenty-one years old..... the adult dose.

After sixty years the dose should be gradually diminished as age advances.

CHAPTER II.

DISEASE.

In commencing the study of disease we wish our readers to divest their minds of any idea if they entertain such, that diseases or their treatment are in any way connected with the supernatural.

Disease is the result of rational causes and cures wrought by medicines are natural operations.

The human race is very prone to believe in the miraculous, and this characteristic has been taken advantage of by the unscrupulous charlatan in all ages to palm off on the public many shams. In no line perhaps, has this been carried to so great an extent as in the treatment of disease. In ancient times and in certain uncivilized countries at present, diseases were treated by enchantment and incantations, and the preparations of "healing potions" were surrounded by the greatest mystery. Universal knowledge in the form of free schools is fast dispelling these erroneous ideas and at present only in exceptional localities, can men or women long maintain a reputation as physicians on such grounds as being born "a seventh son;" "a twin;" "the son of a great man;" "of Indian or Hindoo ancestors," or other fallacious claims.

Common sense, quickened and improved by perception and observation, combined with a knowledge of anatomy and physiology, are the requisites for successfully studying diseases and their treatment.

There is no such thing as "luck" in the practice of medicine more than in other avocations, and a remedy prepared behind a curtain or within a darkened closet has no more potency than if compounded in the most public place.

We regret that there are many at the present day affixing "M. D." to their names, who encourage the belief that the "art of healing" is inborn, and shroud their acts and remedies with as great mystery as possible.

Dear reader, you can rest assured that it is all for a purpose, and that purpose is the concealing of gross ignorance. Shun these pretenders as the Arab does the deadly simoon.

Disease is defined only by comparing it with health, from which it is a departure.

Disease is the absence or deficiency of health, but this calls up at once the question, "What is health?"

Health may be defined as a state in which all the tissues, fluids and organs of the body have their healthy properties and perform all their functions completely and harmoniously. This perfection of health never actually exists. An examination of the healthiest person would reveal, though it might be slight, variations from the above standard, consequently we express gradation of health by adjectives, as good, excellent, etc., on one hand, and poor, miserable, etc., on the other. Thus it is seen that health and disease are imperceptibly merged together. Dr. Chomel defines disease as "*a noticeable disorder affecting more or less of the constituent parts of the living organism, as regards either their material constitution or the exercise of their functions.*"

Disease is divided into two types, viz.: *Functional* and *Organic.*

A *functional* disease is one of which the symptoms do not indicate any appreciable change of structure, while an *organic* disease is attended with morbid changes in the

structure of an organ, or in the composition of its fluids. For example, palpitation of the heart and torpidity of the liver are *functional* diseases, while enlargement (Hypertrophy) of the heart, and hardening (Induration) of the liver are *organic*.

Acute diseases are attended with symptoms of some degree of severity, and come speedily to a crisis.

Chronic diseases are inveterate or progress slowly. Acute diseases often become chronic and *vice versa*.

Epidemic diseases are such as occasionally infest a community more or less generally at the same time, and which are apt to recur at uncertain intervals or which appear successively or simultaneously in various regions. LaGrippe, which has prevailed so extensively during the last two winters, is a noticeable example of an epidemic disease.

A disease is said to be *endemic*, when it is especially prevalent in any particular locality. Thus if LaGrippe only appeared in one town or city, it would then be endemic.

Contagious diseases are those which are communicable from one person to another, requiring *actual contact*, and resulting from inoculation by a palpable morbid product or virus.

Infectious diseases do not require contact for communication, but are transmitted by poisonous exhalations diffused through the air.

A disease may be contagious and not infectious, for example, syphilis; or both contagious and infectious, as in small-pox; or infectious but not contagious, for example, whooping cough.

Hereditary diseases are such as are transmitted from ancestor or parent to descendant or offspring. They may exist at birth, or may become developed at a subsequent period of life.

Congenital diseases are those born with the individual, as hernia, club foot, etc.

Specific diseases are the result of a definite poison, which reproduces its kind and nothing else, as syphilis, hydrophobia, etc.

Malignant diseases are those which are of a highly dangerous and intractable character, and the symptoms are generally severe from the commencement. Many diseases from the intensity of the symptoms are termed malignant, for example, "Malignant typhoid fever," "malignant scarlet fever," etc. Some physicians use this term to denote cancerous affections.

If we search the history of diseases, we find their existence is almost co-eval with that of man. The number of diseases which are recognized as in active operation, exceeds two hundred and fifty, without including a large number which belong properly to surgery.

Continuing the investigation of the history, we learn how distinct the groupings of the phenomena have continued in relation to time, and how remarkably fixed from age to age, they have retained their integrity of type; few becoming actually lost, and few springing forth as absolutely new. Many well defined maladies are of rarer occurrence at some periods than at others, still they appear, and though in isolated form, they are unchanged in distinguishing characteristics.

The disease known as "Ague," formerly so very common throughout the Northern States that the physicians of fifty or sixty years ago looked upon it as one of the most ordinary disorders, is now so rare that the writer, in fifteen years' practice in a State once noted for its ague, did not meet a single case. At a later period, however, while in Alabama, he met it under the name of "The Chills," and found it accompanied by the same symptoms so graphically depicted by the old physicians of his native State.

Malignant typhus fever of to-day, was at one time known as "the black death;" the great plague of Athens was neither more nor less than a terrible visitation of what

is now known as malignant scarlet fever. Small-pox is the same, when unchecked by the immortal Jenner's discovery, as when Rhazes described it in the ninth century. Galen and Hippocrates were acquainted with cancer, and described it as the same intractable, painful, fatal malady, as that of the present day.

Consumption (phthisis pulmonalis), which so many eminent men of the day are endeavoring to combat, was most vividly described by Cælius Aurelianus. As early as the first century, Celsus gave the signs of inflammation that are used to the present day for recognizing it, viz., *redness*, *swelling*, *heat* and *pain*.

In brief, the more thoroughly we investigate this interesting subject, the surer is the conviction that throughout the known period of human existence, not one new disease has been added, not one withdrawn, neither have they changed. Inflammation of the lung tissues, whether called lung fever, pneumonia or pneumonitis, gives rise to the same symptoms as it did at the time when Moses was rocked by the waves of the Nile; and what is true of this, is also of other diseases.

CHAPTER III.

CAUSES OF DISEASE.

(ETIOLOGY.)

"Whatever is capable of deranging either the functions or any part of the structure of the human body, must be ranked amongst the causes of disease. It is not surprising, therefore, considering the numberless variety of circumstances to which man is exposed, that the causes are very numerous."

There are many classifications of the causes of diseases adopted by medical writers. We shall, however, use for this work what seems to us the most simple and easily comprehended: *Uncontrollable* and *Controllable*.

Uncontrollable causes are of external origin, and include variations of season, of electrical tension, of temperature, of atmospheric pressure, of winds, of moisture, and of the chemical constitution of the atmosphere. They include also lightning stroke and sun stroke. It is needless to enlarge upon these atmospheric changes, as causing disease; that they do is a fact well known to every intelligent observer. They are uncontrollable, and the best that can be expected is that their action be modified by proper hygienic regulations, as suitable clothing, avoiding unnecessary exposure, keeping the system in tone to resist sudden changes, etc.

Controllable causes are of greater interest, as they are in the direct line of prevention of disease. The term "Induced disease" is applied to the class produced by controllable causes and is certainly very appropriate.

Controllable causes, are numerous, and can be arranged under four heads:

1. Excessive and prolonged labor, physical or mental, undue excitement, as in fear, anger, grief and hatred.

2. Substances taken into the body which change its structure. These as a rule are luxuries. If we define a luxury as what is not necessary, but simply enjoyable, there is no exception to this rule.

The agents specially included under this head are alcohol, tobacco and narcotics.

3. Habits which are incident to communities, and include the foolish practice of following fashion in dress, construction of buildings, etc., irregularity of living and insufficient sleep.

4. Marriage of persons with diseased organisms to those with healthy, the result being that hereditary affections flow on in an uninterrupted current.

Of the numerous controllable causes we shall only notice in this connection, a few of the most palpable. The others will be mentioned under the disease or diseases to which they give rise.

ALCOHOL.

Of diseases induced and controllable, those arising from the use of alcohol are, perhaps, the most numerous and fatal.

When we consider that next to water alcoholic fluid is most used as a beverage by a large portion of the population of all civilized countries, to condemn its use and place it amongst the potent causes of fatal disease, seems like a satire upon the boasted intelligence and civilization of the nineteenth century. As a writer of practical facts for the masses, we should consider ourselves neglectful of our duty did we not condemn its use in most emphatic terms, knowing, as every physician must, that many fatal diseases can be assigned to no other origin than the use of alcohol.

If physiological laws be carefully studied, no place for alcohol, as a necessity, can be found. Contemplate its action on living function as profoundly as we may, no force to living matter, and no new matter for the construction of organized tissue are discovered. In whatever direction we turn our attention to determine the value of alcohol to man, beyond the sphere of its value as a drug, we see nothing but a void.

In the study of the persistent effects of alcohol, we see nothing but disease and death, both physical and mental. It matters not in what form it enters the system, whether as cider, beer, wine or diluted alcohol, its effect is the same, and to say that this man only drinks cider, that man only drinks wine, while a third drinks brandy, is merely to say, when the apology is unclothed, that all drink the same danger.

Alcohol is a universal intoxicant, the effect produced being common to all animals. Man with his superior intelligence and reason, however, is the only one that persists in its use till a train of morbid conditions follow, which are unequaled by any other arising from a single cause, a fact which very few individuals would credit, were the knowledge gained otherwise than by personal observation.

"O, that men should put an enemy in their mouths, to steal away their brains! that we should with joy, revel, pleasure and applause, transform ourselves into beasts!"—*Shakespeare.*

If the evils of alcohol were made to extend equally to animals lower than man, the result would be most disastrous, as in a very short time none of them would be tamable, workable or eatable.

The first action of alcohol upon the system is that of vascular and nervous excitement. In other words, through its effects upon the nervous system, over-action of the heart is produced. Two eminent investigators—Dr. Parker and Count Wallowicz—experimented upon a young and healthy adult man to determine the actual increase in the heart's action from the use of alcohol.

They counted the beats of the heart at regular intervals for six days, the subject being allowed nothing but water to drink; then for a like period they gave from one to six fluid ounces of alcohol in twenty-four hours, the food, clothing and surroundings in every other respect being the same. The average number of beats during the six days water was taken was 106,000. The average for the time alcohol was given was 127,000, or an increase of 21,000 beats in twenty-four hours, a little more than one-fifth. The lowest estimate of daily work done by the heart is equal to lifting 122 tons, one foot; thus the daily excess of work from the use of six ounces of alcohol is equal to lifting twenty-four tons one foot. Little wonder is it that the heart should flag after such overwork, and still less the cause of wonder that the brain and muscles, which depend upon the heart for their blood supply, should require the rest of long sleep for renovation. While the heart is thus working under alcoholic stimulation, the circulation of distant parts is quickened, and the vessels distended. This is noticed in the early stage and is spoken of as the "flush produced by wine." This increase of blood is not confined to the skin, but extends to the various organs, brain, liver, kidneys, etc. This constitutes the stage of excitement.

If the action of the alcohol be carried to the second stage the functions of the small brain and spinal cord are affected. Just how this takes place is not yet known, but the change in the functions is well marked and consists of loss of power and co-ordination of muscular movement. The nerve stimulus is enfeebled. The muscles of the lower lip fail first, and next those of the lower limbs.

There is usually vomiting in this stage, especially in young subjects.

If the influence of this narcotic be continued still further, the *cerebrum* or large brain becomes implicated. "These are the centers of thought and volition, and as

they become unbalanced and thrown into chaos, the mind loses equilibrium, and the rational part of the nature of man gives way before the emotional, passional, or mere organic centers. The reason now is off duty, or is fooling with duty, and all the mere animal instincts and sentiments are laid atrociously bare. The coward shows up more craven, the braggart more braggart, the bold more bold, the cruel more cruel, the ignorant more ignorant, the untruthful more untruthful, the carnal more carnal. "*In vino veritas*" expresses faithfully, indeed even to physiological accuracy, the true conditions. The emotional faculties are all in wild disorder; foolish sentimentality extending often to tears, grotesque and meaningless laughter, absurd promises and asseverations, inane threats or childish prediction impel the tongue until at last there is a failure of the senses, distortion of the objective realities of life, obscurity, insensibility, sleep and utter muscular prostration."

Following immediately is the last stage which is that of coma or true apoplexy, a condition in which the subject is said to be "dead drunk," a not inapplicable term, muscular power gone, will power gone, senses all gone, dead; only two nerve centers remain true to duty, the center that calls into play the respiratory action and the center which stimulates the heart; thus kind nature prevents self-destruction.

At the very first there is an increase of temperature of the surface of the body at the expense of the vital organs. This soon declines, and from hour to hour through the various stages the animal heat gradually falls.

These are the immediate effects of drinking alcoholic liquors, and if relinquished after the one indulgence no very great harm would result, but if continued for a considerable length of time, it is capable of producing a chronic injury to the brain and mind.

By impairing the functions of the former it brings on

the shaking paralysis of delirium tremens; by an action on the mind it causes strange hallucinations, as noted in the latter part of the second stage, and the habitual despondency which characterizes that disorder. Habitual drinking of alcoholic beverages gives rise to a chronic inflammation of the liver, called *cirrhosis*, which is succeeded by dropsy. Its effects enter directly into the causation of many other affections such as degeneration of the heart and bloodvessels, fatty liver, epilepsy, muscular tremor, inflammation of the stomach, various dyspeptic disorders, Bright's disease and diabetes. Indirectly the habitual use of alcohol favors the production of nearly all diseases by lessening the power of resisting their cause, and it contributes to their fatality by impairing the ability to tolerate and overcome them.

Perhaps the most lamentable and most to be regretted result of the habitual use of alcohol is its *hereditary transmission*.

Of the many inscrutable designs of nature none is more manifest than this, that physical *vice* like physical *virtue* and *physical* features descend in line. Not one of the transmitted wrongs, physical or mental, which are passed to those yet unborn, is more certain than those which are inflicted by alcohol. Many specific diseases engendered by it in the parent, are too often stamped in the child; while the propensity to its use descends also, making the evil interest compound in its terrible totality. We have already taken more of the reader's time in dealing with this single cause of disease than we first intended —and the hundredth part is not told—but have no apology, as we consider no subject in our whole national life is worthier of serious thought.

TOBACCO.

In the list of luxuries tobacco as a cause of disease may be ranked next to alcohol. The diseases arising from

its use are functional and with few exceptions, are rapidly recovered from, if the habit be abandoned. The question is often asked the physician, which is most injurious, chewing or smoking tobacco? We reply, chewing is bad, smoking is worse. This opinion is formed from the effects produced. Looked at with a view to cleanliness, the above observation would have to be reversed. A careful chemical examination of tobacco smoke has been made by different investigators and is found to be composed of water in the form of vapor, carbon or soot, ammonia, (also in vapor), carbonic acid gas, and nicotine. The nicotine contains a bitter principle which gives it the dark brown color. These different agents act in various ways upon the body. The water may be set down as harmless, the carbon acts as a mechanical irritant, and discolors the bronchial secretions and the teeth. The ammonia causes the biting or smarting of the tongue, and also the dryness of the mouth and throat. It also acts upon the blood, tending to make it more watery; carbonic acid produces headache, sleepiness and lassitude.

The effect of nicotine is to produce tremor, palpitation of the heart and paralysis. The unpleasant odor of the breath of smokers is also due to nicotine.

It would lead to unnecessary detail to enter into the various stages and degrees of action of tobacco upon the body, and consequently we shall sum them up briefly, referring our readers to the more elaborate work for minuteness of detail. As smoking is more common, we shall give its effects rather than that of chewing. Smoking acts, (1) upon the blood causing undue fluidity, and change in size and shape of the red corpuscles; (2) upon the stomach giving rise to debility of this organ; (3) upon the mucous membrane of the mouth and throat producing soreness of the tonsils, redness and dryness of the membrane, and sponginess of the gums; (4) upon the heart; resulting in weakness of this organ and irregular action,

(5) upon the lining surface of the bronchi and lungs, prolonging any irritation that may be present, and causing cough; (6) upon the organs of sense, causing when excessively used, dilation of the pupil of the eye and confusion of vision, inability to define sounds clearly, the occurrence of sharp ringing sounds in the ear; (7) upon the brain, impairing the activity of that organ.

These effects are severe even on those who have attained manhood, but in the young the habit of smoking causes impairment of growth, premature manhood, and physical decay.

The other injurious substances that are included under controllable causes and against which we particularly wish to caution our readers, are opium and its compounds,—morphine, Dover's powder, laudanum, etc., chloroform, chloral hydrate, ether, chlorodyne, cocaine, absinthe. These are most excellent remedial agents when so used, but taken as luxuries, are capable of working great harm to both mind and body. There is not only the immediate danger which results from an over dose of these drugs, but the use soon becomes abuse, a habit is formed, which becomes so firmly fixed upon the individual that only those of exceptionally strong will-power ever free themselves from the baneful influence.

These substances all act either directly or indirectly upon the nervous system, and enter into the causation of a large number of disorders to which this system is subject.

Morally it makes no difference whether an individual is intoxicated from the use of opium, chloral, alcohol or other narcotics, and when society puts its condemnation upon all with an equal degree of severity, a step in advance will have been taken toward suppressing the use of these agents.

LATE HOURS AND BROKEN SLEEP.

Insufficient and broken sleep is an active agent in the production of diseases. To specify any one disease originating from irregular sleep would be very difficult; there are, however, certain impairments resulting from this habit, which very greatly depress vitality, and thereby invite an attack of disease. The importance of sleep to the human economy cannot be over-estimated; it is of more consequence even than food. Every act performed requires the expenditure of a certain amount of vital force, and this is repaired during sleep only. One who is accustomed to regular and sufficient sleep feels quickly the symptoms if deprived for a single night only, of "Tired nature's sweet restorer, balmy sleep."—*Young.*

There is a feverish feebleness and a hazy condition of mind, accompanied by increased nerve susceptibility which if not painful is at least disagreeable. It requires two or three nights of good sleep to restore the natural state of mental and physical strength. Those who are habitually broken of their sleep do not notice such marked symptoms from the loss of a single night's rest. Thus we often hear persons remark that they can do with four or five hours' sleep, and it matters not how late they go to bed, they always arise at the same hour. We hear youth also exulting in their power to forego sleep, and that they "won't go home till morning," as if some great virtue of courage or wisdom were conveyed in the declaration.

These people are sowing the wind and will reap the whirlwind in shattered nervous systems, weakened mental and physical activity, faded cheeks, sunken eyes, and premature old age. Sleep is the greatest gift of the Heavenly Father. Irritability of temper, peevishness, uneasiness, insanity, a weary mind or body, languor and prostration, hypochondria, headache, neuralgia, broken spirit, sorrow, are all ameliorated, and some cured by:

"Sleep, that knits up the raveled sleeve of care,
The death of each day's life, sore labor's bath,
Balm of hurt minds, great nature's second course,
Chief nourisher in life's feast."—*Shakespeare.*

It is observed by every practitioner of medicine, that those who sleep irregularly are most easily affected by direct causes of disease and are less amenable to means of cure, while those who take full and regular sleep recover most readily from sickness. The observation of this truth gave rise at one period in the history of medicine, to the theory that sleep was the natural cure of all diseases. It is certainly a great aid, and without it remedies would be of no avail. "Sleep reduces fever, quickens nutrition, increases elimination, soothes pain, and encourages healing of wounded surfaces. Whoever is first to discover the unknown cause of natural sleep, and the mode by which it may be commanded by art for the service of mankind, will be the greatest healer who has up to this age helped to make medicine immortal."

ERRORS OF DRESS AS A CAUSE OF DISEASE.

Woman's dress furnishes a valuable topic for the preacher, satirist and physician. That errors in this direction are a prolific source of indirect cause of disease is a fact which cannot reasonably be denied, but the wholesale denunciation of woman's attire, as is often done, results in very little good. The corset and manner of supporting the clothing are the subjects which have received most attention. The writer for a number of years took special pains to inquire into these subjects, and found the almost universal opinion of the sex to be in favor of a properly fitting corset. That it gives support to the muscles of the back, is undeniable. The wider diffusion of physiological knowledge has nearly done away with tight lacing, the principal objection to the corset.

Another thing that is doing much to stop this silly and

pernicious habit, is the existing sentiment of the male population. The ladies are fast learning that a waist which resembles a wasp is not the ideal of the opposite sex. That each wishes to appear to the best advantage in the eyes of the other is undeniable, and we trust that women will place their seal of disapproval upon many of the existing vices of the male sex with like beneficial results.

As to whether the clothing should be supported by the hips or shoulders, we advise that the weight be divided between the two; the shoulders being allowed to do the minor part of the work. We realize that this is not in accordance with the prevailing opinion of either the majority of medical men or the dress reform agitators. A moment's reflection in regard to the shape of women's hips and the mechanical construction of the skeleton, will show that the weight of the skirts is better borne from the hips than the shoulders. If the skirts are supported by the shoulders it adds to the weight resting upon the spinal column, which explains why women so often remark that they cannot wear their clothing supported from the shoulders, as it causes backache. The working woman whose garments perhaps weigh not to exceed a couple of pounds, and is supported from the shoulders and hips equally, places her arms akimbo when she stops to rest. Why? To take a part of the weight off the spinal column.

As before stated, a combination of the two points of support will give the greatest ease. Many of the corsets made at the present time have this idea incorporated in their construction, and instead of being detrimental, are, when properly fitted, a decided advantage to the wearer.

Errors of dress are not limited to the one sex; many youth and young men are in the habit of binding up their clothing by means of a belt tightened firmly above the hips. The effect of this is identical with tight lacing. The pressure of a tight cravat, collar or shirtband, works

great injury, as it retards the free flow of blood to and from the brain. Evils of a tight or badly fitting shoe or boot will be referred to further on in this work.

ERRORS FROM CHANGE OF CLOTHING.

In so variable a climate as that of most parts of the United States, many dangers spring from change of attire at different seasons; the latter part of autumn and early spring are the times of greatest danger. During the former period, light clothing is worn unconsciously too long; a sudden fall of temperature that causes excess of moisture, robs the half protected body of its heat; the surface bloodvessels are contracted and the blood is driven to the internal organs and lining membrane of the air passages and alimentary canal, bladder, etc. This is rapidly followed by reaction with increase of temperature, and a cold exists which manifests itself in one individual by a cough, another by diarrhœa, and a third by an inflammation of the lungs or peritoneum. The same morbid conditions are apt to result from discarding winter clothing too early in the spring, before settled weather has been fully established. Another error of dress is the wearing of socks, stockings and flannels which contain poisonous coloring principles. The chief poisonous dyes are the red and yellow coraline, substances derived from aniline; this coloring principle is extremely active as a local poison, causing an eruption of the skin of minute round pimples, red in color, and slightly raised. In severe cases the pimples fill with water, and if ruptured, form a superficial sore. This disease is readily cured by discarding the dyed flannel. Garments worn next to the skin should contain no coloring matter whatever. Those made from natural wool are preferable.

We have in a brief manner noticed some of the most active causes of disease which are directly under the control

of every person, so far as they pertain to that particular individual. None of these causes add to our happiness, to our mental or physical good. Why then risk health by indulging in any of them? No fear need be entertained of any physical or mental harm from abstaining from them. If you wish to keep the mind and body in perfect health, strive to hold the passions in subservience to the reasoning faculties; this rule applies to every passion, whether it be born of an unnatural appetite, or engendered by personal pride and fostered by public opinion; whether innate or acquired. While exercising control of the passions, do not suppress such as are ennobling, as they are promoters of health, happiness and long life; but the destructive passions of anger, hate, fear, jealousy and grief, induce disorders of both mind and body.

CHAPTER IV.

SYMPTOMS AND THEIR STUDY.

Having learned something of the nature and causes of disease, we are now prepared to proceed a step further and study the phenomena occurring in their course. These are called symptoms. Any change occurring in the body or its functions which indicates a deviation from the line of health, can be classified as a symptom. Thus change in shape, size or color of any portion of the body, observed by touch or sight; inability to make natural movements of a part; increasing or decreasing of the heart's action, as indicated by the pulse; elevation or depression of the body's temperature, as shown by the thermometer, are symptoms pointing to a diseased condition of some nature.

In speaking of "the symptoms" of a disease, is meant the morbid phenomena occurring in connection with that disease. The same symptom is often present in a large number of cases; for example, cough, headache, increase in temperature; there are, however, certain variations in different affections which give these and other symptoms distinguishing features. Thus a loud and barking cough, occurring with croup, could not be mistaken for that of pleurisy, which is suppressed, and of a hacking nature; neither would the headache of indigestion (sick headache) be taken for that occurring in the course of spinal disorders. One is located in the front, the other in the back part of the head. The distinguishing symptoms will be given in connection with the different diseases further along

in the work. We wish, however, in this connection to notice a few of the important things to be observed in every case, viz., pulse, temperature and tongue.

THE PULSE.

The *pulse* is produced by the contraction of the *heart*, forcing the arterial blood to the extremities. Each impulse of this organ gives a forward movement to the blood, and owing to the alternate contraction and relaxation of the *heart* the blood is impelled toward the extremities in wave-like movements. If the finger be placed over an *artery* which lies near the surface, a sensation is experienced at every beat of the *heart*, as though the vessels were striking against it. This beating is known as the *pulse*, and is an accurate measure of the *heart's* action, both as to force and frequency. (See Chap. V., page 68). Heart, Arteries, Capillaries and Veins.) The *radial artery*, for convenience, is usually selected for "taking" the *pulse*. This requires a little practice, but can be learned in a short time, and we advise the reader to begin at once by counting, first his own *pulse*, and then that of a friend, comparing one with the other until he or she becomes familiar with the procedure. A watch with a second hand is all that is necessary. Begin first and count the beats for a minute, then for one-half and one-quarter of this period, and by comparing the results it is easy to see whether a mistake has been made or not. An error likely to occur with beginners is counting the *watch ticks* rather than the *pulse beats*. To avoid this do not look at the watch only to get the point from which to begin to count, and when the beats reach the number you think they should for the period you are counting, again glance at the watch to see if time is up. An interesting and instructive exercise is comparing the frequency of the *pulse* in persons of different ages; also difference in the same individual when occupying different positions, as in

standing, sitting or reclining. In feeling the *pulse* three fingers should be used. By *frequency* of *pulse* is meant the number of beats in a given period of time; *quickness* relates to the rapidity of the *pulse wave*, or in other words, the time required for the blood to pass beneath the finger. The *pulse* may be frequent, but not quick, and *vice versa*. *Regularity* refers to the time occurring between successive beats. A regular *pulse* is generally considered a favorable sign. An *intermittent pulse* is one in which a pulsation is occasionally omitted. It sometimes occurs in persons in apparent good health, and under such circumstances has no great significance. The same can be said of it when present in dyspepsia, as it occasionally is. Occurring, however, in the course of acute disease, it is an unfavorable sign, especially in pneumonia or articular rheumatism.

As to conditions influencing the pulse, number of beats at different ages, etc., the reader is referred to Part First of this volume.

TEMPERATURE OF THE BODY.

A knowledge of the *temperature* of the *body* is the most valuable aid in the study of disease. In order to ascertain this a *fever thermometer* is indispensable, and we advise our readers to procure one, which can be done at most any druggist's at a nominal price. The sensation communicated to the hand placed on the skin to ascertain the heat of the body, is extremely unreliable. A cold surface is often accompanied by high temperature, and *vice versa*, or the patient even may complain of coldness when the thermometer indicates increase of heat or the reverse.

Before detailing the variations of temperature in disease it is necessary to learn the standard of health. If the temperature were ascertained at the vital centers it would be found to be 100 degrees Fahr. This, of

course, is impossible, and the standard fixed upon from a large number of observations taken in the axilla is 98.5 degrees. In persons under fifteen years this would be increased to about 99 degrees. The normal temperature is raised by active exercise and by external heat. It is diminished by exposure to cold, by severe mental exertion, and cold bathing. A safe rule to follow in reference to whether disease is indicated by the temperature or not may be thus stated: *A rise above* 99.5 *degrees F. or a depression below* 97.5 *degrees is a sure sign of some kind of disease, if the change be persistent.*

Fever is always attended by a rise in temperature. The increase to 100 degrees or 101 degrees only, signifies a mild attack. A constant temperature of 105 degrees implies severity of disease; a rise of 106 degrees to 107 degrees denotes danger, and a fatal termination may be expected if the thermometer shows a rise to 109 or 110 degrees. In rare cases this latter high temperature may be present without a fatal termination, but in such instances it continues for only a short time and its occurrence is not easily explained. We sum up what is generally agreed upon by saying that as long as the temperature continues above the healthy standard the disease is not ended, no matter what the other symptoms may be. Whenever convalescence is about to be established, a regular fall of temperature will be noted; a progressive increase of heat from day to day denotes a corresponding increase in severity of the disease.

In making observations the morning temperature of one day should be compared with that of the preceding morning. The same rule should be followed in reference to the evening temperature, otherwise a mistaken opinion may be formed. This remark is particularly applicable to cases of *typhoid fever*. (In typhoid fever there is always an increase in heat from morning to evening, and a decrease from midnight to sunrise). In convalescence

a rise in temperature indicates a probable relapse or the commencement of some other affection; during the progress of fever, or in acute disease, a sudden and marked rise of temperature, insufficient to denote impending death, is evidence that some serious complication is about to occur. The temperature is less liable to fall below the normal standard, and has less significance.

HOW TO TAKE THE TEMPERATURE.

The *axilla* is the most convenient place; the instrument should be slightly warmed by the hand till it gets up to about 94 degrees, "the register" having been previously shaken down, and then the bulb placed deep within the *axilla*, and the arm folded across the chest. With children it may be necessary to hold the arm in this position. The instrument should remain in this situation ten minutes, and care should be taken that no portion of the clothing is between it and the patient's skin. Further remarks in reference to temperature will be made as the different diseases are described and treated.

THE TONGUE.

The general indications afforded by the *tongue* are most important, since it not only sympathizes with different parts of the alimentary canal and the organs connected with it, but more or less with the whole system. The mode of protruding the *tongue* should be observed, as it furnishes valuable information at times.

If there is inability to protrude this organ, or it is done slowly, or when the organ trembles much in the attempt, there is either great prostration or some exhausting nervous disorder or cerebral disease. In the early stages of typhoid and typhus fever the *tongue* is tremulous. In chorea (St. Vitus dance) the tongue is suddenly protruded, and as rapidly withdrawn.

Dryness and *moisture* are conditions of the *tongue*

which should be carefully noted. Dryness indicates a general tendency to diminished secretions. It is most common in continued fever, in inflammation of the abdominal organs and serous membranes. When the tongue, after having been furred, becomes dry, rough and dark colored, a state of dangerous prostration is indicated with contamination of the blood. *Moisture* of the *tongue* is a favorable symptom, especially when it follows a dry, furred condition. The moisture first appears at the edges, and gradually extends. This change is usually followed by improvement of all the symptoms.

The *color* of the *tongue* should be noticed. In anæmia, after loss of blood, any affections of the spleen, and most chronic disorders, the tongue is pale. In inflammation of the palate, tonsils and throat, the tongue is red; in gastric and bilious fever and severe dyspepsia the redness is limited to the tip and edges. But of all the conditions of this member the most valuable is that known as *furred*. This condition is present in inflammation, in irritation of the mucous membrane, in diseases of the brain and its membranes, in all varieties of fever, and in almost all acute and dangerous diseases. It is not, however, always a sign of disease, as some persons habitually have a coated *tongue* especially on rising in the morning. When the fur is white, thick, moist and uniform, it usually indicates an active state of fever, without inflammation or malignant tendency; when of a yellow hue, there is generally disordered action of the liver, with retention of bile in the blood. Sometimes the red, swollen papillæ project through the coating, giving the tongue a peculiar appearance; this is well seen in scarlet fever, and as the fur clears away, the papillæ are more distinct and give the organ a strawberry appearance. Much is learned from the manner in which a coated tongue begins to clean. Thus when the fur slowly retires from the tips and edges, thinning gradually as it retires, it is a sign that conva-

lescence will be rapid and permanent; when it separates in flakes and patches beginning in the center or toward the root of the organ, leaving the surface underneath red and shining, the convalescence is apt to be tedious and interrupted. And lastly, when the crust is rapidly removed, and the exposed surface has a raw appearance, or glossy, or fissured, or dark colored, the termination is very likely to be fatal.

CHAPTER V.

DISEASES OF THE BONES AND JOINTS.

RICKETS. (*Rachitis*).

Rickets is a disease of early childhood, occurring usually before the age of ten, and is the most common of the "diathetic" affections. It is due to mal-nutrition of the body, arising from improper feeding, either from a lack of knowledge as to proper foods, or from an inability to obtain the same, as a result of which the bones are not supplied with the proper component parts, the vegetable matter being largely in excess. This condition leads to bending of the bones from their natural position, and in time to permanent deformity.

Symptoms.—Profuse perspiration of the head during the night, a desire to throw off the bedclothes and *tenderness of the general surface*, are the early symptoms pointing to this disease. These with general weakness of the whole body accompanied by a weakened or impaired digestion, an unnatural bending of one or more joints, makes a plain case of rickets.

This disease is curable if taken in time and even after it has progressed to a considerable extent, the child if properly cared for, will "grow out of it."

Treatment.—Consists of an abundance of fresh air and sunshine, a plain, nutritious diet. Milk is of the first importance and next to it is beef tea.

The child should be kept as much as possible in a

reclining position, and neither standing or sitting should be allowed for any length of time.

As the general health and powers improve, more exercise may be allowed, but not to the extent of producing fatigue.

The bowels should be kept open, but not purged. Mechanical treatment of course calls for the aid of a qualified surgeon.

In addition to above treatment, give the following as directed:

No. 1.

℞

Phosphorus	gr. $\frac{1}{6}$.
Oleum Amygdalae dulcis	fl ʒ vii ss.
Gum Acacia	ʒ iij.
Aquae Dist	fl ʒ x ss.

M.–Sig.:—ʒj three times a day.

Cod liver oil is an excellent tonic in this disease and can be given by commencing with five drops at first, after feeding, and increasing one drop each day until a teaspoonful or more is taken three or four times a day.

FELON OR WHITLOW.

A *Felon or Whitlow* is an inflammation of the fingers or toes, and generally situated at the last phalanx; the seat of inflammation being in the membrane (periosteum) next to and surrounding the bone.

NOTE.—It often happens, that a prescription is given for the relief of diseases, which utterly fails. This, in the majority of instances, is due to the medicines used in compounding it. To those likely to be adulterated, or improperly prepared, we have appended P. D. & Co., meaning Parke, Davis & Company. We have prescribed the preparations put up by these manufacturing pharmacists for the past fifteen years, and always found them reliable; and would advise our readers to ask their druggist to use the preparations as indicated. If the remedy prescribed is not kept in stock by the druggist, a request on the part of the purchaser to have it ordered will insure its being kept in the future.

Its probable cause is a bruise, which accounts for the fingers being attacked much oftener than the toes.

Attention is first called to this injury by a sharp pricking pain, not unlike that from getting a sliver or brier in the finger, in fact patients are often loth to believe that it is anything more.

In twenty-four to forty-eight hours the pain becomes intense, and is of a throbbing character. About this time usually (not always), a little pus-like fluid forms at the point where the pricking sensation was first felt. This has a tendency to confirm the theory that the trouble is caused by getting a sliver in the finger. The escape of the fluid, however, gives no relief, nor is any obtained until the pus formed beneath the periosteum is given an exit. This should not be delayed as there is danger of the bone becoming diseased with a consequent loss of a part or the whole finger, or even the entire hand.

Treatment. Upon first suspicion of a felon, bind the finger firmly with a narrow tape one-eighth inch wide, commencing at the end of the finger and continuing to the joint next above the painful point. Let this bandage remain until the throbbing becomes unbearable, then remove quickly and rest the finger for a few minutes and again rebandage as before, only a little more firmly, and again release and again rebind, continuing the treatment for one hour, at the end of which the finger will be reduced about one-third its usual size, and if you have "taken time by the forelock," your felon will be cured.

If, however, at the end of twenty-four hours the pain still continues, apply a poultice made from *salt* thoroughly dried over a hot stove, *finely shaved Castile soap* and *Venice turpentine*, one teaspoonful of each; mix thoroughly and apply, changing every twelve hours. Upon the fifth day visit your medical adviser and have a *free* incision made to the bone, after which apply the linseed meal poultice recommended in the back of this book.

It would also be advisable for you to take sufficient *Epsom salts* to move the bowels freely and follow with a general tonic, as prescribed in :

No. 2.

℞

Quiniae Sulph.	ʒ ss.
Acid Hydrochlor. dil.	ʒ ij.
Tr. Columbae	fl ʒ j.
Fl. Ext. Nucis Vom. (*P. D. & Co.*).	" ʒ ss.
Syrup Simp. q. s. ad.	" ℥ iv.

M.–Sig.:—ʒj three times a day before meals.

SPRAINS.

Under this head we shall speak only of the joints in which this injury occurs most often. The word sprain is indefinite and gives but little idea of the extent of the injury, as it is applied to cases where the ligaments are only stretched, as well as to those where complete laceration takes place. Sprains occur in nearly all joints to a greater or less degree, but the most common locations are the back, knee and ankle.

It is unnecessary to give the symptoms of this disease, as any one so unfortunate as to be afflicted with it will be able to recognize it without a description.

Treatment.—In all cases of sprains, in whatever location, *rest*, with hot applications, is essential, the patient being allowed to assume such position as gives the greatest ease. In sprains of the back, after twenty-four to forty-eight hours, apply to the afflicted part the plaster prescribed in

No. 3.

℞

Emplastrum Opii et Belladonnae.

Sig.:–Apply to the part, as directed.

In sprains of the back, where much swelling occurs,

it will be advisable to call the family physician, as the swelling may be caused by extravasation of blood.

Sprains of the Ankle require further notice, as it often happens that an apparently trivial injury of this joint proves to be a most serious matter. The justly celebrated Dr. Lewis A. Sayre of New York, is in the habit of speaking of patients suffering from this injury as "being so unfortunate as *not* to break their leg," believing a sprained ankle, if *neglected* or unskillfully treated, to be far worse than a broken bone, which would necessitate keeping the bed for a few weeks. A number of cases have come under the notice of the writer where a slight twisting of this joint, considered as "not worth minding," resulted in months of suffering, and in one case of loss of the part.

Treatment. Rest, perfect and uninterrupted, is of the greatest importance. If the part is painful in the least or swollen, place the foot in a deep vessel nearly filled with water at the temperature of 70 degrees F.; then gradually add boiling water as long as it can be borne, keeping it at this high temperature for half to three-quarters of an hour. Then remove and bandage moderately firm. This hot water bath should be repeated four to six times in twenty-four hours, until pain and swelling are gone. The foot when not in the bath should be kept elevated. This treatment, if thoroughly followed, may save you many times the price of this work, and better far, days or even weeks of suffering, and possibly the loss of a valued member.

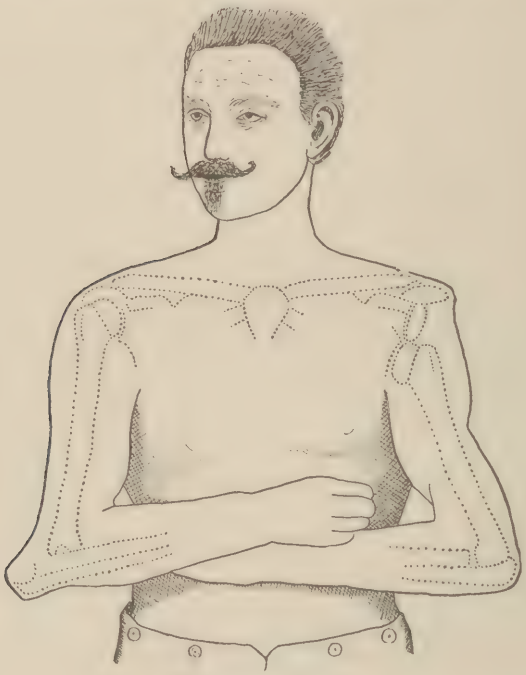
DISLOCATIONS.

(PUTTING OUT OF JOINT.)

Presuming that the reader has studied the illustrations and description of bones and joints, given in Part First of this volume, and has become familiar with the manner in which bones are bound together by the ligaments, to form

joints, it will not be necessary to enter into a description of either again.

By a dislocation is meant a displacement of one of the bones of which the joint is compos d, from its natural situation. The accompanying illustration will very materially aid the reader to an understanding of this term.



Engraving No. 22.

At the left shoulder and right elbow, the bones are seen to be "out of joint." The changed appearance of the injured joint is very noticeable, when compared with the corresponding one of the opposite side.

Symptoms.—Loss of motion, change of appearance, pain in the joint, increased by attempting to move the parts, are the symptoms that will indicate a probable dislocation, and furnish abundant grounds for the immediate calling of the surgeon. Until the doctor comes, endeavor to relieve the patient's suffering, by supporting the injured

parts. Remove the clothing by cutting or ripping the seams. Apply cold water to prevent inflammation. The doctor when he arrives will need material for bandages, and it will be well to have these at hand, that no time may be lost. Material somewhat worn is better than new. A cotton sheet is about the best, and is always obtainable. Do not tear it, but wait and have the doctor show you how to do it, as a bandage that would be of proper width in one case might not do at all in another. Have a needle and thread where it is convenient, also some pieces of thin boards for splints. After the doctor arrives be prepared to render such assistance as may be required, remembering that the diagnosis of dislocations is not always easy, especially in fleshy persons, neither is the returning of the disjointed bone to its proper place. The latter procedure may call for the administration of an anæsthetic, such as chloroform or ether.

A strict compliance in every detail of after treatment as laid down by the surgeon should be observed, and the patient and friends can rest assured that in a very short time the joint will be as useful as ever.

HIP-JOINT DISEASE.

This is an inflammatory disease affecting the ligaments, membranes and bones of the hip joints.

Most cases occur before the age of twelve years. It is a serious affection, though curable, and its treatment should be intrusted only to a qualified surgeon. If a child receives a hurt upon the hip followed by pain and limping; if pain is caused at this joint by standing or walking; if there is any swelling or spasms of the muscles in the locality, we most earnestly urge that you seek advice as to the cause. Hip-joint disease may occur as late in life as forty years, or above.

CURVATURE OF THE SPINE.

This deformity may be either *lateral* or *angular*. The former is due to the ligaments and muscles which maintain the spinal column in its erect position, becoming relaxed. The latter is caused by softening of the bones of the spinal column.

Lateral curvature is more common, and is found in girls from ten to twenty years of age. Enervating, luxurious habits and sedentary occupations are causes which lead to this deformity.

Angular curvature, known as "Pott's" disease, consists in a curving backward and upward of the spinal column, producing the deformity known as "hunchback."

The treatment of spinal curvature belongs to the domain of surgery.

CLUBFOOT.

Clubfoot is a deformity of the foot in which it is changed from its natural position, and may be turned either out or in; or the heel may be drawn up so the toes only reach the ground, or the reverse.

Combinations of these four forms may exist; for example, the foot may be turned *out* and the heel drawn up.

Clubfoot is often hereditary. It may be *congenital* or *acquired*, and attacks males more frequently than females; especially is this true when it is hereditary.

Clubfoot is cured by mechanical appliances. About fifty per cent. first require an operation to divide the contracted tendons. These operations are without danger, but call for a skilled operator.

KNOCK KNEE, BOW LEGS, FLAT FOOT AND WRY NECK.

These belong like clubfoot, to the painless deformities. The terms are self-explanatory, and as that treatment belongs to surgery, we will not enter into its description.

CHAPTER VI.

DISEASES OF THE SKIN AND MUSCLES.

PARASITES.

Without entering into a description of the different parasites that affect the skin, producing eruptions of various kinds, we wish to speak briefly of the very disgusting and annoying little pests that make different portions of the surface of the human body their home, not by the "right of discovery" but by right of having so done from earliest historical records. (Exodus viii: 17–18).

The democratic ideas of this country, which permit the indiscriminate massing together of all classes in street car and railroad coach, make it possible for the most fastidious to possess for a limited time, a variable number of these loathsome and odious insects.

LICE. (*Pediculi*)

Receive their names from the locality upon which they are found, as *pediculus capitis* or head louse, *pediculus pubis*, pubic or crab louse, which attaches itself to the hair around the pubis and anus and sometimes extends to the arm pits and breast. *Pediculus corporis.* Body louse found oftener in the clothes than upon the body. The head louse is most common.

For body lice use (No. 4) for a wash for the body, and in addition dust the clothes with insect powder, and lay aside for a few days.

Lice are easily gotten rid of by care and cleanliness,

avoiding the sources of transmission, and in the thorough application of the following to the parts attacked:

No. 4.

℞

Acidum Carbolicum	ʒ j.
Aquae Rosae	o ss.

M.–Sig.:—Apply with a stiff brush upon retiring.

BALDNESS. (*Alopecia*).

If the reader has not done so already we advise that he read and study carefully what has been written, in Part I, of this volume, in reference to "*The Hair.*" From it will be learned, that the hair follicles and sebaceous glands are important in keeping the hair in its natural condition. If for any reason the hair follicle becomes diseased, the hair falls out.

If the follicles are not entirely destroyed, a fine woolly growth is produced instead of the natural hair, which encourages the person to believe that in a short time he will be rejuvenated by a luxuriant hirsute growth; especially is this true if just previous to its appearance a generous application of some highly lauded "restorer" has been made. Such hopes are fallacious. The most common cause of baldness is a hereditary predisposition. This is more likely to show itself in the male than the female branches of the family.

Excessive brain work, over-anxiety, sexual excesses, early and fervent adoration are *not* causes of baldness as is shown from the fact that many profoundly educated persons, and also those of dissipated habits have luxuriant growths of hair, while on the other hand many persons, who neither think seriously or are burdened with care, lose their hair early in life.

The wearing of heavy, ill-ventilated hats is next to heredity, the most frequent cause of baldness. This explains why men are oftener bald than women. The

beard never falls out for the reason that it gets an abundance of air and sunlight. If the hair bulbs are destroyed there is no possible way of developing new ones, and baldness arising from such a cause is incurable.

When the hair begins falling out, and if the bulbs are not destroyed, much benefit will come from the use of the following:

No. 5.

℞

Quiniae Sulph.		ʒj.
Glycerina	fl.	ʒj.
Tinct. Cantharidis	"	ʒj.
Lanolin	"	ʒj.
Spt. Myrciae	"	ʒij.
Ext. Fl. Jaborandi (P. D. & Co.)	"	ʒss.
Aquae Rosae	"	ʒxvj.

M.-Sig.:—To be well shaken and applied three times a week with a stiff brush.

The hair often falls out after many acute diseases, such as typhus and typhoid fever, pneumonia, etc., and also during the puerperal state; all that is required in this case is clipping off the ends of the hair, washing the head two or three times a week with cologne, and after it is dry apply well down to the roots of the hair a little plain cosmoline or castor oil.

DANDRUFF (Or *Dandriff*).

This is a diseased condition of the scalp which gives rise to the formation of scales or particles, which are thrown off, giving great annoyance from the unsightly appearance it causes.

Treatment. Do not use a fine comb or in any other way irritate the scalp. Brush the hair daily using a soft brush: sage leaves, 1 ounce; pulv. borax, 1-4 ounce. Place the sage in a tin porcelain vessel and pour over it 1 pint boiling soft water, and allow to simmer thirty minutes, strain, and add the borax when cold, then add 1 ounce

alcohol, and sufficient water to make 2 pints. After using the above, brush the hair dry and apply Prescription No. 6.

In this connection we wish to caution the readers of this book as to the injuries often arising from the use of "hair dyes" and "hair restorers." Almost invariably they are compounds of *inert* materials, sold under a high sounding name, or *active poisons* which, when absorbed by the pores of the scalp, cause headache, eruptions of the scalp, ringing in the ears, and weakened sight. This is also true, though not to so large an extent, as to advertised "hair pomade," "unctions," etc.

Nothing is of so great importance in promoting the growth of the hair as a *thorough* cleansing of the scalp once a fortnight with soft water, and thoroughly drying with a towel, and at least every month having one-half to three-quarters of an inch clipped from the ends. The hair should be so arranged for the night as to permit the air circulating through it freely. The more the hair is brushed and gently combed the better. If for any reason the hair becomes unnaturally dry or crisp the prescription given below, No. 6, will be found a most elegant application.

No. 6.

℞

Oleum Ricini (Castor Oil), best.... fl. ʒ ij.
Spts. Cologne (95%)..... " ʒ xiv.

M.-Sig.:—Apply as a dressing.

CORNS.

Corns occur either upon the hands or feet, and consist of thickened skin, the result of interrupted pressure. When upon the feet they are produced by ill-fitting boots, and upon the hands by irritation from handling tools.

"Soft" corns are located between the toes. They are

more painful than the "hard" corns, and are more rapid in their growth, due probably, to a greater moisture.

Treatment. Removing of the cause will in all cases effect a cure if commenced early. This applies to soft as well as hard corns.

Well fitting boots, neither too small nor too large, are of first consideration. If the corn is of long standing, purchase of your druggist ten grains salicylic acid and mix *thoroughly* with a teaspoonful of fresh lard. Apply upon retiring, on muslin, of this salve a piece the size of a large pea, holding it in place by means of a well-fitting bandage. Wipe off in the morning, and cover lightly with cotton wool. Repeat this next evening, and upon the third soak the foot for thirty minutes in warm water. The corn can then be removed by gradually inserting the edge of a knife between it and the true skin until loosened, and then lift out with pincers or thumb and finger.

For soft corns, remove the pressure by inserting between the toes any soft material wool direct from the sheep is recommended as being best—and dust the corn with the following:

No. 7.

℞

Zinci Oxidum.....	gr. x.
Morphia Sulph.....	" j.

M.-Sig.—Use externally as directed.

In a short time this will become dry, and then treatment for "hard" corn can be used for its removal.

BUNIONS

Are usually situated at the second joint of the great or third of the little toe, and are caused from long continued pressure, producing a bursa.

Bunions are more likely to occur from tight boots than corns. Shoes with narrow toes are especially liable

to cause bunions, as by drawing the toes together their axes is correspondingly changed from its natural line.

The bursa is first formed as a protection to the compressed joint, and if we heed the warning and remove the cause very little harm results. If not, we suffer the penalty in sleepless nights, and in extreme cases in the loss of a useful joint.

Treatment. This is one of the cases where the old adage "Prevention is better than cure" is particularly applicable. A shoe as wide as the foot should be worn at all times.

If the bunion is red and painful, apply cold water dressing until inflammation subsides, then paint the part sparingly with

No. 8.

℞

Tinct. Iodi. comp	fl. ʒ ss.
Potass. Iodidum	gr. v

M.-Sig.:—Use externally as directed.

INGROWN TOE-NAIL.

This very painful affection is due more to the soft parts being pressed upon the nail than from any *ingrowing* of it.

Treatment. The first thing is to remove the external pressure. Cut the nail first straight across well down to the quick, then a V shaped notch in the center. Do *not* cut the nail at the sides. To draw the tender part away from the nail, take a strip of adhesive plaster one-third inch wide, and four to six inches long. Fix one end firmly to the skin near to the inflamed part, then carry it down and under the toe holding it taut, then up on the opposite side and attach it to the upper surface of the foot, holding it in situation by placing two or three narrow strips of plaster across it at right angles. If properly applied this will give relief, and in a few weeks effect a

cure. Apply to the tender point, No. 8, and keep covered with a little cotton wool.

CHILBLAINS.

These are local inflammations which occur upon the hands and feet, and occasionally upon the different parts of the face, as the cheeks, nose and ears.

The cause of chilblains is a sudden change of temperature, either from cold to heat, or *vice versa*. Persons with feeble circulation are more liable to chilblains than those with robust health. The cause in females is often the circular elastic used for supporting the hose; by retarding the circulation it predisposes to an attack of this affection. Chilblain varies from a mild inflammation of the skin attended with redness, tenderness, and a mild itching, to a more severe inflammation, with blisters and intense burning. If the blisters are broken ulceration may follow.

The irritation is always increased toward evening, or from external warmth of either fire or bedclothes. Climatic changes often increase the itching.

Treatment. If the clothing in any manner interferes with the circulation correct the evil; if debilitated "run down" the prescription below (No. 9) taken four to six weeks, will be very beneficial.

No. 9.

℞

Ferri cit. et Strych	ʒ iij.
Vinum album	fl. ℥ iv.
Tinct. Gaultheriæ	" ʒ j.
Syrup Simp. q. s. ad.	" ℥ vj.

M.–Sig.:—ʒj three times a day after meals.

As a local application use *White Liniment* (see domestic recipes) or paint the parts with *Compound Tr. Iodine*, using a camel's hair brush.

If there are no abrasions of the skin, No. 10 applied

with a soft brush is a most excellent and soothing remedy. The *aconite* can be left out if the skin is broken, and scratch it from the prescription before taking to the druggist.

No. 10.

℞

Lin. Belladonnae	fl. ʒ ij.
" *Aconiti* (*Br. Ph.*)	" ʒ j.
Acid Carbolicum	♏ x.
Collodium	℥ j.

M.–Sig.:—Use externally as directed.

The covering for the feet should be *warm* and *loose*. A tight boot or shoe is detrimental in the extreme.

COLD FEET.

Many persons suffer from cold feet, not from exposure, but various causes easily avoided, if properly understood. Women are by far the greatest sufferers in this respect.

It is quite a common thing for the physician to hear them remark, "My feet are always cold, doctor, and it don't seem to make any difference how much I warm them or what I wear, either." A careful inquiry will, in the majority of these cases, show the cause to be due to the arrangement of the clothing. Any mode of dressing that interferes with the free circulation of the blood has a tendency to produce this condition. It is fair to presume that the reader is sufficiently familiar with the circulation of the blood—so graphically described in the chapter on Circulation—to understand the above statement. The blood carried by the arteries to the extremities, and returned by the veins to the center of the body, is easily influenced by mechanical interference, such as a too closely fitting corset, an elastic garter, a shoe one or two sizes smaller than the foot, and more particularly is it harmful if there is any cording at the ankle. Enfeebled

circulation arising from causes other than mechanical obstruction, also cause cold feet.

Treatment. From what has been written as to the causes of this condition, the treatment evidently is to increase the amonnt of blood in the extremities. Wear nothing that will in any way obstruct the flow of blood to or from the feet. Strengthen the circulation by using No. 11, which is as follows :

No. 11.

℞

Strychnia Sulph. crys.	gr. ss.
Alcohol	fl. ʒ ij.
Tinct. Ferri Mur.	" ʒ iij.
Syrup Simp. q. s. ad.	" ℥ iv.

M. By dissolving the Strychnia in the Alcohol, and then add the other ingredients.

Sig.:—ʒj three times a day before meals.

As you value your health do not go to bed with cold feet as a sleepless night is sure to ensue, followed in the morning by a headache and an acidulous temper, which will add nothing to the happiness of yourself or friends.

As an external application for cold feet, nothing is equal to cold water. In the morning immerse the feet in a basin of cold water for a few *seconds* only, Rub dry with a coarse towel and afterward use a flesh brush briskly, not only on the feet, but entire lower extremities; and wear only stockings made of wool. Care should be taken that the stockings are thoroughly aired before putting them on. At night before retiring remove stockings and warm the feet for some considerable time by holding the bottoms to the fire and then apply cold water as described for morning treatment. If you enjoy dancing, a waltz of five to ten minutes in your bare feet, letting them slide upon the carpet, will put the blood in circulation and increase the chances of a good night's sleep.

BURNING OF THE FEET.

Is as annoying as cold feet though not as common, nor is it as likely to lead to ill-health. Placing the feet for a few minutes in water as hot as can be borne often relieves this affection.

SWEATING OF THE FEET.

This may be relieved in mild cases by bathing the feet upon going to bed in equal parts of water and *cider* vinegar and allowing them to dry without wiping. In very bad cases use (No. 12) which has long been in use in the German army.

No. 12.

℞

Acid Salicylicum	grs. vj.
Starch	" xx.
Finely Powdered Soapstone	" CLXXiv.

M.-Sig.:--Use externally as directed.

This should be sifted outside, and in the stockings.

CARE OF THE FEET.

It will be understood from what has already been written as to the causes of the numerous ailments of the feet, that the care of them is of more than ordinary interest. It has been seen that in a majority of these ailments the cause is traceable, directly or indirectly, to the manner of dressing the feet. No better proof of this is required than the fact that among the half civilized nations that wear little or nothing upon the feet, corns, bunions, ingrown toe nails, etc., are unknown. The importance of a properly developed foot is appreciated by every breeder or owner of a horse, and if about to purchase one of these noble animals he exercises the greatest care in examining its feet to see that they are in proper condition ; the fit of the shoe is scrutinized, and everything bearing upon this important member is inquired into, while, possibly, his

children's shoes interest him only as to whether they will prove serviceable or not, and he usually selects a pair a size or two too large in order to get full value for his money. The other extreme is to purchase shoes very much too small, that the feet may look "stylish." One is equally as bad as the other, and both tend to destroy the beauty and usefulness of the foot, and in place of natural ease and grace the movement becomes stiff and awkward.

At no time should a shoe be worn that is narrower than the foot either at the *heel* or *ball*. A shoe too short works equal harm as the narrow. The shoe should be of such size as to give comfort, and at the same time fit the foot properly.

It does not need a knowledge of anatomy to convince the shallowest thinker of the sex which worship the idol of fashion that the foot is forced into a wholly unnatural position, and distorted by the heel being raised and the body made to rest on the ball of the toes, and we will not question the reader's intelligence by entering into a description of the many evils this silly practice engenders. Shoes made from materials that are impervious to air are harmful, as the moisture that is constantly being given off from the feet, is prevented from escaping, producing a condition incompatible with health or comfort. The advice, "Keep the feet *warm* and *dry* and the *head cool*," is as valuable as it is old.

WARTS.

If the skin be examined with a magnifying or reading glass numerous little elevations are noticed. These are the papillæ of the skin. If several of these papillæ are elongated and their covering thickened, it forms a *wart*. The cause of warts is unknown, and their disappearance is often equally puzzling. From this arises the many charms for removing them, such as selling them, throwing salt in the fire over the left shoulder, rubbing the wart with split

beans picked in the *new* of the moon, etc. Warts, from their great number and size, require treatment for their removal. For this purchase two cents' worth of *chromic acid* and apply by introducing a glass rod into the acid and touching each wart. Two or three applications, at intervals of as many days, will be sufficient. *Castor oil* applied daily for two or three weeks will effectually remove them. This last mentioned remedy is a sure cure for warts on the horse.

BARBER'S ITCH (*Sycosis*).

This is an inflammation of the hair follicles of the beard terminating in the formation of pus. The skin about the beard also becomes red and swollen.

This disease occurs only in males and those of adult age, and oftenest in those who have a tolerably thick beard. Dull razors, irritating soaps seem to act as exciting causes, but the *real* cause of the disease is unknown.

Symptoms and Causes. The first symptoms are feelings of heat and stiffness, soon followed by little red elevations between the hairs of the beard; these fill with watery fluid. After a time a yellowish fluid is noticed in the elevations, always having a hair in its center. These little elevations, or *nodules*, on the second day burst, and the contents form into a crust of a brownish color.

As the disease advances the nodules, at first scattering, increase in number till the crust covers the entire surface in the vicinity of the attack. The appearance at the time somewhat resembles a fig, hence the medical name *sycosis*, from the Greek, meaning fig. Under the most skillful treatment this disease often continues for years, and when cured leaves a red glistening surface, devoid of beard, which resembles a scar.

Treatment. Before retiring smear the affected surface *thickly* with either plain cosmoline or vaseline; over this place a linen cloth well covered with the same, and outside

of the cloth oiled paper, or better oiled silk, and hold all in place by means of a four-tailed bandage. In the morning wash off, using any *good* shaving soap; after the crusts are all removed, shave. After shaving, any *nodules* that may appear should be opened, using a sharp knife or needle. This should be repeated—shaving and all—every other night. During the interval between shaving, anoint the face with (No. 13), rubbing in well.

No. 13.

℞

Sulphur ..... ʒ j to ʒ ij.
Oleum Rosae .....gtt. v.
Cosmoline ... . ℥ j.

M.–Sig.:—Use locally as directed.

PIMPLES. (*Acne.*)

Acne is of two varieties, viz., *acne vulgaris* and *acne rosacea.* The follicles often become obstructed by the sebaceous matter hardening, thus forming what is known as a *comedo.* The accumulation of dirt and dust in the opening of the follicles forms what is vulgarly called "black heads." When the sebaceous matter thus accumulated is pressed out it has a fusiform appearance, due to the shape of the opening through which it passes. The form in connection with the blackheads (dirt) has misled many to believing the sebaceous matter was a species of worm or larva.

Acne consists of an inflammation of the obstructed follicle, forming comedones, and constitutes acne vulgaris, or "face pimples."

In a majority of cases, such inflammation continues until pus is formed, though it may stop short of this.

Very few persons ever escape entirely from acne vulgaris; the time intervening between childhood and manhood or womanhood, is the period of usual attack. It never attacks children, and it is very unusual for acne

vulgaris to continue into advanced age. It attacks males oftener, yet many a young woman has had to regret an attack of it, at a time when she was desirous of making her *debut* in fashionable society.

Cause. From the fact that this disease occurs with greatest frequency at the age of puberty, it is not unreasonable to suppose it is in some way connected with the changes taking place in the sexual system. There are, however, no good reasons to ascribe its cause to masturbation, sexual excess, or excessive chastity. Acne vulgaris occurs independent of any blood disorder, and the taking of "blood purifiers" will do *no* good, and possibly harm.

The seat of the disease is the face, back and shoulders, upper part of chest, arms and buttocks. It appears most often upon the face.

Treatment. Upon retiring rub each pimple with No. 14, washing off in the morning, using soft water to which has been added a little pure castile soap, and wipe dry and apply mild bay rum.

No. 14.

℞

Hydrarg. Ammon	ʒ ss.
Oleum Rosae	gtt. v.
Cosmoline	⅔ ss.

M.-Ft. unguentum et sig.:—Apply externally as directed.

If the above does not prove satisfactory, we advise a trial of the following:

No. 15.

℞

Huile de Cade	ʒ ss.
Adipis Preparat	ʒ j.

M.-et ft. unguentum. Sig.:—Apply night and morning.—"*Tilbury Fox*," *London.*

Acne rosacea appears *only* upon the face, the sebaceous glands of the nose being the usual ones attacked, though the disease may extend to the forehead and cheeks, and in

severe cases the whole face is involved. The inflammation in acne rosacea is of a chronic form, and does not terminate by pus formation. The nodules are larger than in acne vulgaris, and the color more like copper. This disease is very common among persons who drink wine and brandy, and constitutes the "rum blossom." Acne rosacea is not confined to those who tipple, and to infer that a person was intemperate because afflicted by this disease would be an unjustifiable conclusion.

Many women during the climacteric period are troubled with acne rosacea even though they never touch spirituous liquors. This is very embarrassing to them from the prevailing opinion that the disease is the result of habitual wine drinking.

Treatment. As soon as the disease makes its appearance, all alcoholic drinks must be discontinued, not excepting *even cider*. The writer has seen several typical cases of this disease, the evident cause being hard cider drinking. If any derangement of menstruation exists it must be corrected. As an external application use No. 16.

No. 16.

℞

Sulph. Sublim	ʒ ij ss.
Acid. Tannic	ʒ j ss.
Ung. Petrolii	℥ iij.

M.–et ft. unguentum. Sig.:—Apply to the afflicted part upon retiring.
—"*G. H. Fox*," *London.*

MOTH PATCHES. (*Chloasma.*)

This disease, known also as "liver moth," is one of frequent occurrence. It consists of yellowish-brown patches on the forehead, chin, temples and lower parts of the cheeks. It is extremely rare in men. It is attended with no pain or other disagreeable symptoms, and other than its disfiguring the looks, is of little importance.

There is hardly any disease, excepting it be of a serious

nature, which women dread more than "moth patches." This is doubtless due to the long continuance of the disease, and the many ineffectual remedies.

Causes. These are very little understood. Many physicians ascribe the cause to inactivity of the liver; this we think is incorrect. The disease occurring, as it often does during pregnancy and disappearing after parturition, would, it seems, point to the generative organs as the location of the cause.

Treatment. Any trouble of either ovaries or uterus, must be corrected, as the case may warrant. See diseases of the Ovaries and Uterus, in Vol. II.

As an external application, use (No. 17,) which should be applied to the patches at bedtime.

No. 17.

℞

Bismuthi subnitras ..... } aa.	ʒ j.
Hydrarg. Ammoniat ..... }	
Ung. Petrolii	℥ j.

M.–Ft. unguentum et sig.:—Use externally as directed.

In the morning wash off, using soft soap or *tincture* of green soap; if the latter is used, apply to the discolored portion with a piece of sponge, rubbing moderately and immediately bathe with soft water and apply a little *plain* cosmoline. In a few days the discoloration will begin to disappear, and in the course of a fortnight will have nearly, if not quite, disappeared. Unless the disease affecting the internal organs be removed, it will be necessary to continue this ointment, otherwise the "patch" soon returns again.

SUNBURN.

Ladies who sunburn easily can prevent it by washing the face with the juice of a fresh lemon, and allowing it to dry before going out. If sunburned, smear the face with cold cream made after the formula given under "Miscellaneous Toilet Recipes;" this will subdue the swelling. If

this is not at hand, use fresh sweet cream. The discoloration disappears in a few days. If, however, you desire to hasten the process, you can do so by using No. 18.

No. 18.

℞

Hydrarg. Chlorid Cor. ..... gr. j.
Emulsion of Almonds ..... fl. ʒ ij.

M.-Sig.:—Apply externally, using a soft rag or sponge.

FRECKLES.

These little blemishes, due to an over-production of pigment in the skin, can hardly be called a disease. They are, however, a very undesirable possession, and many persons, especially those with blonde complexions, are greatly annoyed by them. Why the coloring matter is deposited in spots is not understood, or why the sun's rays should produce this result; therefore a cure cannot be expected. The affection can, however, be relieved by the use of remedies that cause a temporary disappearance of the freckles; for this use:

No. 19.

℞

Acid. Lacti ..... } aa. fl. ʒ ss.
Glycerina ..... }

M.-et sig.—Apply night and morning with a sponge.

If a more active remedy is required, use the following:

No. 20.

℞

Acid. Salicylicum ..... grs. xxx.
Spiritus Myrciae ..... fl. ʒ ij.

M.-Sig.:—Apply night and morning, using a soft rag or sponge.

Another method of removing freckles is by the application of *pure carbolic acid*, and is done by stretching the skin with the thumb and finger of the left hand and touching each freckle with a glass rod dipped into the

acid and allowing it to dry; this causes a whitish-yellow spot that peels off in from two to four days, leaving the skin natural in color.

SALT RHEUM OR TETTER. (*Eczema*).

This is the most common of all skin diseases, and consists of an eruption of small vesicles closely crowded together. These when ruptured discharge a watery fluid which soon dries and forms a yellowish crust. The discharge is characteristic of the disease, and a piece of linen wet with it becomes, when dry, stiff as though starched.

There are a number of species of this disease. When the vesicles are minute and unattended by inflammation, it is named *eczema simplex*. If accompanied with heat and swelling, and redness, denoting inflammation, it is called *eczema rubrum*. When the eruption affects the scalp it is called *eczema capitis*. If produced by the rays of the sun, *eczema solaris*. There are other forms of this disease, but they are so rare that they need not be mentioned.

Causes. These consist of local irritation, in some cases; in others, the cause seems to be connected with the digestive or menstrual functions, while in many cases there is no doubt the disease is hereditary.

Symptoms. Itching, with an irresistible desire to scratch; numerous vesicles, discharging watery fluid, which forms a crust; the discharge acting upon linen as before described, are the symptoms that characterize this disease.

Treatment. The causes of eczema being so different, it must follow that the treatment will vary greatly. A combination of local and constitutional remedies will succeed oftenest.

As an internal remedy cod liver oil is of first importance, commencing with a few drops, and gradually increasing the dose to one or two teaspoonsful, according to age,

three times a day. As an external application No. 21 is one of the best:

No. 21.

℞

Hydrarg. Ammon. ..... ʒ ss.
Ung. Petrolii (carbolized)..... ʒ j.

M.-Ft. unguentum. Sig.:—Apply externally as directed.

This should be rubbed over the affected surface, using the finger. Leave the crusts or scabs on as long as they will remain. If the skin looks red when the crust falls off the disease is not well, and the ointment should be applied again. In eczema of the head and face of children when the discharge is quite plentiful, do not dry up too rapidly, as it may affect the digestion, or cause catarrh of the air passages.

If the disease does not rapidly improve under the above treatment, it will be advisable for the patient to see a dermatologist.

HIVES, OR NETTLE-RASH. (*Urticaria.*)

This is a non-contagious affection in which the eruption consists of prominent patches, usually red, occasionally white, irregular in shape, and of uncertain duration. The eruption is accompanied by heat, burning, and intense itching.

Urticaria has two forms, acute and chronic, the latter being very rare; both varieties attack persons of all ages.

Causes. This disease is due to some derangement of the organs of digestion, often arising from some particular article of diet; some individuals suffer from an attack of the eruption after the use of strawberries; others cannot eat shell fish. The strange part is that food which *never* fails to produce an attack in one person, has not the slightest effect upon others.

Treatment. Lime water made as directed under

domestic receipts will relieve the burning and itching, and in twenty-four to forty-eight hours effect a cure. This should be used both internally and externally. Take a teaspoonful every two to four hours and bathe the eruption frequently with the same. If this is not at hand, rub the surface with buckwheat flour, olive oil, or vaseline to allay the itching. Avoid such articles of diet as are known to cause the disease.

ROSE RASH, OR FALSE MEASLES. (*Roseola*)

This affection is of little importance, except that it is sometimes confounded with measles and scarlet fever.

It commences with constitutional disturbance of varying severity, denoted by fever, headache, loss of appetite, and general ill-feeling; the eruption appears in thirty-six to forty-eight hours, and is *rose* red in color and appears irregularly on different parts of the body; is not raised above the adjacent surface. There is no soreness of the throat as in scarlet fever, or affection of the air passages as in measles. The rash continues from two to five days, gradually getting duller. One attack of roseola does not prevent a recurrence of the disease. There are no serious results following this affection.

Treatment. A mild cathartic is all that is required.

RINGWORM. (*Tinea Tonsurans*).

This is a chronic contagious affection confined to the scalp, and is recognized from the hairs having the appearance as if nibbled off, and are dry and brittle. The diseased part is round, and covered with a scaly eruption.

Cause. The disease is due to a vegetable parasite.

Treatment. Rub the affected surface with *oleate of copper*, first clipping the hair.

If this should not effect a cure apply *thoroughly* over the diseased part, and for a short distance around, turpentine rubbed in well with the finger; after five minutes

wash off with carbolic soap and afterward with hot water; then paint with No. 22, using a camel's hair brush:

No. 22.

℞

Tr. Iodi	ʒ ss.
Potass. Iodi	grs. viij.
Aqua dist. q. s. ad	fl. ℥ j.

M.–Sig.:—Apply externally as directed.

This application is to be made twice a day for five days, and then once a day for five to eight days. Ten to fifteen days suffice for the worst cases.

Another form of ringworm attacking the body is called *Tinea circenata*. It occurs in circular patches that are red in color and have a scaly eruption; it is attended with itching.

Treatment. Same as ringworm of the head.

ITCH. (*Scabies.*)

Itch is due to the presence of an animal parasite, *acarus scabiei*. It is contagious,—requiring contact for its transmission.

The eruption is of a vesicular character presenting a number of watery heads, distinctly separated from one another, and attended with violent itching. Close observation of the eruption reveals little furrows extending from it, in the end of which the parasite lies, and can be seen, by means of a magnifying glass, as a little white speck. Under sufficient magnifying power the acarus resembles somewhat, the tortoise.

The furrows mentioned before are peculiar to scabies, and when present settle all doubts as to the disease. The head and face are the only parts of the body which are not attacked by scabies. The most frequent locations are between the fingers, wrists, fore part of the arms and belly, named in the order of greatest frequency. The

exception to this is in children, when the disease is often upon the feet and buttocks. There is no febrile disturbance. The itching is not limited to the seat of the eruption, and is worse when the patient becomes warm.

Treatment. Scabies never gets well of itself, but is easily cured, hence the saying, "It is no disgrace to have the itch but it is to keep it." The following (No. 23) rubbed over the *entire* body twice a day will cure in ten to fifteen days:

No. 23.

℞

Sulphur Sublim	ʒ ij.
Balsam. Peruvianum	ʒ j.
Butyri Petrolii	℥ iij.

M.-Sig.:—Use as directed.

A warm bath should be taken every third night, applying the ointment after, and retire.

ST. ANTHONY'S FIRE, OR ERYSIPELAS.

This is an inflammatory affection of the skin, due to blood poison of a specific nature, and varies in intensity from a diffused inflammation of the skin, to an inflammation of the cellular tissues, or the two combined. "It is characterized by the affected parts becoming of a shining deep red color, hot, painful and swollen. It attacks all parts of the body, but the integumenti of the face and head are the most common seats of ideopathic erysipelas, —that which arises from internal causes,—while traumatic erysipelas—that which follows wounds—may occur on any part." It is both infectious and contagious.

The local symptoms are preceded by constitutional disturbance, beginning with a chill and accompanied by fever, nausea, and sometimes vomiting. If in addition to these symptoms there is swelling and tenderness of the glands of the neck and throat, an attack of erysipelas may

be safely predicted, even before local symptoms appear. The pulse is increased in frequency, and the tongue is coated; bowels may be constipated or relaxed. Usually about forty-eight hours after the chill, a slight redness appears upon some part of the skin, quite frequently the side of the nose; this deepens in color and spreads rapidly.

The redness disappears upon pressure but returns quickly. After three or four days from the appearance of the redness it begins to fade, and is followed by peeling of the skin. The *average* duration of this disease is twelve to fifteen days. Simple erysipelas, or that which attacks the skin only, is not a serious disease, but the deep seated, *phlegmonous*, is on the contrary, a very grave affection. The latter is accompanied with great swelling, and the formation of pus. The inflammation sometimes extends to the brain or its membranes, causing delirium and coma.

Treatment. The bowels should be acted upon first by giving *one compound cathartic pill*, followed in six hours with a dose of epsom salts, varying from a teaspoonful to a tablespoonful, according to requirements; the patient will be the best judge as to the amount, the object being to get a free movement without purging. After this give two grains of quinine every three hours.

Local Treatment. Elevate the affected part and apply cloths rung from cold buttermilk, changing often. Food should be nourishing, such as milk, beef and mutton soups. Give plenty of fresh air, but protect the patient from drafts. This treatment will be sufficient for simple erysipelas.

Phlegmonous Erysipelas requires the attention of a skilled practitioner. If for any reason it is impossible to obtain such, follow directions for treating the simple form and in addition give No. 24 every three hours, alternating with the quinine :

No. 24.

℞

Tr. Ferri mur.	fl. ʒ iij.
Glycerina	" ℥ ss.
Aqua q. s. ad.	" ℥ ij.

M.–Sig:—ʒj every three hours.

As a local application, instead of the cold buttermilk apply warm linseed meal poultices, changing every hour. If any quieting medicine is required, give No. 25, a tablespoonful every two to four hours, as is necessary to produce rest:

No. 25.

℞

Chloral Hydrat.	ʒ j.
Potass. Brom.	ʒ ij.
Syrup Simp.	fl. ℥ j.
Aqua q. s. ad.	" ℥ iv.

M.–Sig.:–ʒ iv every two to four hours, as required

Three to four ounces of pure milk, or its equivalent, should be given every three hours, five or ten minutes after the quinine.

If erysipelas is epidemic in the locality, it is certainly safe to prepare for an attack, by moving the bowels with one or two *compound cathartic pills*, and following with three grains of quinine three times a day for a week. This will not prevent an attack, but will put the system in condition, so the disease will, in all probability, run a mild course. Individuals addicted to the use of stimulants are more liable to erysipelas than others. When epidemic it is very apt to attack wounds.

Persons with wounds or sores upon their hands should use extreme caution in handling patients with this affection. All clothes used as dressing should be burned or disinfected.

The conscientious physician will not perform operations or attend a woman in confinement, while treating

erysipelas, without thoroughly disinfecting his person and clothing.

MUSCULAR RHEUMATISM.

This term is used to denote a condition of the muscles characterized by pain and tenderness. It is, however, more nearly allied to neuralgia than rheumatism. The disease develops gradually. The pain, which at first is slight, becomes more or less severe. If the muscles involved are kept at rest, the pain is very little. Any movement, on the other hand, which causes contraction of the affected parts, produces excruciating pain. This leads the patient to avoid, as much as possible, movements of the muscles affected. The pain often changes from one muscle, or set of muscles, to others. There is no redness or swelling of the parts as in articular rheumatism. There is no fever or other constitutional disturbance in this disease. The appetite is usually unimpaired. The disease may be *acute* or *chronic*. In the latter form it is not unusual to experience pain only when movements are first made after a period of rest, which soon disappear if the movement be continued. The acute form continues from a few hours to a week; the chronic, indefinitely. The chronic form of this affection constitutes the disease known as the "rheumatis" or "rheumatics" in common parlance.

The muscles of *all* parts of the body are subject to attacks of this disease, and names corresponding to the affected location are used to thus designate it. If the muscles of the neck are involved, with inability to rotate the head (stiff neck) it is named *rheumatic torticollis;* when the loin muscles are affected, *lumbago*. This form is very apt to become chronic.

Pleurodynia is the name used to denote rheumatism of the thoracic muscles. In this situation the disease may be

mistaken for *acute pleurisy*. If there is very little or no fever and no cough, the latter can safely be excluded.

Treatment. In whatever location muscular rheumatism occurs, the treatment is essentially the same. In the acute form bathe the parts thoroughly with

No. 26.

℞

Chloroform	℥ 80.
Tr. Aconiti	aa. fl. ʒ iv.
Tr. Opii	
Lin. Camph. comp. q. s. ad	" ʒ ij.

M.–Ft. linimentum. Sig :—Use as directed.

The affected muscles should rest in the position most favorable to avoid contraction. Another very excellent application for this affection is *oil of wintergreen*, rubbed in well. If it is necessary to give any quieting medicine, get ten grains *Dover's powder* and divide into three equal parts, giving a powder every one, two or three hours, as is required to allay the pain. When the pain is not severe enough to confine the patient to the house, a very excellent treatment is the application of an "*aconite* and *belladonna*" plaster, and when this has been worn a week or ten days, remove and apply in the same place a warming plaster made of "*pitch* and *cantharides*."

Treatment of chronic muscular rheumatism is very unsatisfactory. Take a blister made from the Spanish fly the size of a quarter dollar, apply to the affected muscles for about four hours, or till a superficial blister is produced; then remove a short space and cause another blister to form, continuing this until three to six (according to extent of tenderness) of these little blisters are produced. As soon as the plaster is removed cover each blister with cosmoline applied on old cotton cloth. In three days' time apply a fresh plaster to spot No. 1, and continue in rotation as before. If a thorough irritation was produced the first time, it will not be neces-

sary to leave the blister on so long a time. This treatment is a little tedious, but very successful. Rubbing the affected part for one-quarter to one-half hour with No. 26 will relieve. As an internal remedy, three grains of quinine, taken four times a day for a week, will be found efficacious. It is a good plan to employ the external and internal treatment at the same time. Persons subject to this affection should avoid exposure of the body to currents of air, especially during sleep, or when the body is perspiring. Flannels should be worn at all seasons of the year. A daily sponge bath, and only sufficient clothing to insure comfort, will lessen the chances of an attack.

MUSCULAR CRAMPS.

Painful muscular contraction often occurs without any obvious cause. Such contraction is known as *cramp*. This may occur in any of the muscles, but those of the lower extremities are generally the seat of this affection. Coughing or sneezing sometimes produces cramp of the muscles of the abdomen. As a remedy for cramp of the lower limbs, Dr. Bardiley of England, recommends sleeping in a bed the head of which is ten to twelve inches higher than the foot. This is usually successful. Cramp of the bottom of the feet can be arrested by pressing them against a flat surface or standing on them for a few minutes.

Involuntary jerking of the head, raising the shoulders, twitching of the muscles of the face, producing grimaces, are due to muscular spasm or cramp, and are largely under the control of the will. The origin of these, in many cases, is mimicry, which becomes a confirmed and irremediable habit. Children should be dissuaded from practices which lead to the forming of these undesirable habits.

Writer's Cramp is a spasmodic affection of the muscles

used in writing, and is caused by *over-exercise* of the affected parts. If writing is attempted, by one laboring under this disorder, the muscles of the forefinger and thumb become either rigid or contract spasmodically, causing inability to guide the pen. Persons who use the needle constantly are sometimes affected in a similar manner. A curious fact in connection with this disease, is that the hand can be used in performing any other act without experiencing any difficulty. A cure is effected by *rest*, if commenced in time. Writer's cramp can be often cured by using a penholder, one and a half inches in diameter, and seven to eight inches long, the upper end being "loaded" with a half ounce of lead.

Alternate contraction or relaxation of the muscles in rapid succession, produces unnatural movements in different parts of the body. This is noticed in advanced age in the tremulousness of the upper extremities, and the lateral motion of the head during waking hours. The trembling of old age is incurable. It sometimes extends to the lower extremities. *Shaking palsy* is the name applied to this affection. A very similar condition to the above, occurs in early and middle life as a result of any cause that depresses the nervous system, such as the abuse of stimulants, opium, chloral and sexual excess. If the cause is relinquished before going too far, the system will recuperate.

CHAPTER VII.

DISEASES OF THE BLOOD AND ITS VESSELS.

NOSE BLEED. (*Epistaxis.*)

Bleeding at the nose frequently occurs, and in the majority of instances requires no treatment. A moderate discharge of blood from this organ is followed by a sense of relief, if pressure or a feeling of fullness exists in the head. No doubt serious results to the brain are often prevented by a discharge of blood from the nose, as the over-distended vessels of that organ are thus temporarily relieved. In a majority of cases it is beneficial, but may be so persistent as to call for measures of relief.

Treatment. The patient should be placed in a cool room, the head be kept raised, and cloths wet with cold water should be held upon the forehead and nape of the neck. Press with the thumb and finger upon the sides of the nose just below the angle of the eye, with one hand, and with the other hand press the upper jaw on each side, just external to the wings of the nose. This cuts off the supply of blood to the nose, and if continued for some considerable length of time, will check the bleeding. With a little experience, the beating of the arteries can be felt on each side in these locations. We advise the reader to endeavor to thus locate them, either upon his own face or that of a friend. Another very successful method of arresting bleeding from the nose, is to take a lump of cotton, tie a thread around it and push gently up into the

nose beyond the bleeding point. This can be determined by the blood running from the nose, as the flow will at first be stopped, but when the cotton is pushed beyond the bleeding point, will again commence; then with the thread draw the cotton down until it covers the bleeding point; a clot is soon formed and bleeding arrested. In twelve to twenty-four hours the cotton can be removed. This plan can be used in stopping nose bleed in the horse.

Nose bleed occurring frequently, may indicate an impoverished condition of the blood (anæmia) and calls for remedies internally. This is usually indicated by the patient looking pale, the membrane lining the eyelids is also paler than in health.

No. 27 should be taken for six to eight weeks and the food should be nourishing, such as milk, eggs, lean beef, mutton, etc.

No. 27.

℞

Tr. Ferri mur.	ʒ iij.
Strychniae Sulph. cryst.	gr. ¼
Syrup Tolutani, q. s. ad.	fl. ʒ iv.

M.-Sig.:—ʒ j three times a day before meals.

SCROFULA.

This term is used to designate a chronic constitutional disease, the symptoms of which are, enlargement of the lymphatic glands, particularly of the neck, and a tendency to development of inflammation of the skin, mucous membrane and bones. The powers of resistance to disease and recovering from the same, are greatly diminished. The enlargement of the glands occurs chiefly in children after the period of infancy, and may continue for months or even years, without softening, and finally disappear by being absorbed. If not absorbed the enlarged glands become slightly inflamed and pus is formed which is discharged spontaneously if not freed by lancing.

Children of scrofulous constitutions are *not* more liable than others to affections of the lungs in after years. That children are born scrofulous is questionable. It would rather seem to us from the fact that the disease does not appear until sometime after birth, that it is due to ill-conditioned hygienic surroundings, or to some defect of nutrition, or the two combined.

A condition resembling, if not identical with, scrofula is often observed in children whose parents are related by consanguineous ties.

Treatment. If for any reason, scrofula is feared, the child should be fed from birth, with a view to furnishing all the elements required by the system. Nothing is equal to mother's milk for this during the first year. As soon as the child is able to take food, it should be supplied in variety and quantity to meet every demand, milk, bread, potatoes, oatmeal, beef tea, etc. These combined with an abundance of pure air and sunshine, will do more than all the medicine in the materia medica. Cod liver oil, if borne by the stomach, is *the* best remedy. Give as directed under treatment of rickets.

ANÆMIA.

Anæmia is a term used to indicate a less normal quantity of the *red* corpuscles in the blood. The term is also used by physicians to denote an insufficient supply of arterial blood to any organ. Thus, "anæmia of the brain," or "lungs," would indicate that these organs were not supplied with the usual amount of blood, and when used in the latter sense is the reverse of *hyperæmia*.

In this place we shall consider anæmia as a diseased condition of the blood, as defined at first. If a quantity of blood, say one-third, were drawn from the veins of a healthy person and the amount replaced by water, it would constitute a typical case of anæmia.

If the deficiency of red globules be produced,—as is

not uncommon,—by any diseased condition of the system, a case of anæmia just as truly exists as in the former instance. The reader will understand that the blood need not be impoverished to a given per cent. in order that this affection be present, as the degree of impoverishment varies.

This affection is of frequent occurrence, and has an important relation to many diseases. The symptoms of anæmia are pallor of the surface, especially of the upper lip and lobes of the ears.

The mucous membrane of the eyelids and lips is also lessened in color; the gums bleed easily. Persons suffering with anæmia are unable to endure cold, and are very liable to cold hands and feet; the pulse is weak; any exertion causes the heart to beat more rapidly; "shortness of breath" is experienced from slight exercise, such as ascending stairs. Physical or mental acts require more than ordinary effort, and are soon followed by fatigue; an irritable temper is not uncommon, and much anxiety respecting the health is expressed by the patient; in place of the natural buoyancy and energy, a feeling of lassitude and indolence is present. Palpitation is frequent, which leads to the belief that organic disease of the heart exists; neuralgia in various situations is a prominent symptom. Anæmia may be present in individuals who have an unusual amount of color in health without very much pallor being observed. The urine is usually light in color.

Causes. Loss of blood as a result of hemorrhage from wounds or from the lungs, flooding, and the like; deficient nourishment, the blood being insufficient in quantity or quality; prolonged expenditure of the elements of the blood from which the red corpuscles are formed, as in lactation and frequent child-bearing, are obvious causes of anæmia when it exists independently of the disease with which it is associated.

At or near the age of puberty anæmia is apt to occur

in females without any appreciable cause, and is then known by the name *chlorosis*. The cause is, without doubt, the derangement of the assimilative functions dependent upon the changes taking place in the generative organs at this period. In these cases there is a great perversion of the appetite, and it is not unusual for the patient to crave indigestible substances, such as chalk, slate, tea grounds, etc. Lead and mercury, when introduced into the blood, and continued any length of time, cause anæmia.

Treatment. The first point in the treatment of this affection, is to ascertain the cause and remove it. The next object is to restore the blood to its natural condition. This is best done by a nourishing diet; lean meat, milk, eggs, wheat bread, etc., in connection with out-door exercise, which stimulates and strengthens digestion and assimilation. No. 28 is known as Blaud's Pill, and has a reputation for the cure of *anæmia* and *chlorosis*, which extends into nearly every country having a written language.

No. 28.

℞

Ferri Sulph. pulv. .....
Potass. Carb. puras. ..... } aa. ʒ ss.
Tragacanthæ q. s.

M.–Ft. Pil. No. xcvi. Sig.:—Take as directed.

These pills should be taken one three times a day, to begin with, and every third day increase the dose by one pill until three pills are taken three times a day. This should be continued until the prescription has been filled three times. If there is any aversion to pills, take

No. 29.

℞

Hydrarg. Bichlorid ..... gr. j.
Sodae Arseniat. ..... grs. iij.
Strychniae Sulph. ..... gr. ½.
Vinum Ferri Amarum ..... fl. ʒ xvj.

M.–Sig.—ʒ ij in water after meals.

These remedies will prove sufficient unless the disease be associated with other affections of an incurable nature.

SCURVY. (*Scorbutus.*)

This is a diseased condition of the blood, produced by an insufficient supply of foods containing certain nutritive principles required by the system, in order that a healthy standard may be maintained. These principles are contained in vegetable food, hence the disease is frequent in those individuals who subsist for any considerable time, either from choice or necessity, on an exclusive meat diet.

Symptoms. The appetite fails, followed by a sense of languor and an indifference, or even dread as to physical or mental exertion. There is great pallor of the surface. The most characteristic symptom of this affection is swelling of the gums, and the readiness with which they bleed on pressure; the gums are unnaturally red. Fetor of the breath is a prominent symptom. The ankles are often swollen, and the patient complains of pain in the loins and lower extremities. Palpitation is occasioned by slight exertion. The urine is high colored; the pulse is slower than in health, but is increased in frequency from exertion.

The above symptoms, in connection with the fact that generally a greater or less number of persons become affected under circumstances corresponding to those mentioned as causing the disease, make the diagnosis comparatively easy. If recognized in time, and carefully treated a recovery most always occurs.

Treatment. It will be understood from what has already been written, that scurvy is preventible by dietetic measures, and one likely to be subject to circumstances causing the disease, should provide suitable means for intercepting it.

Lemon juice, raw potatoes, pickles, onions, raw cabbage, sauer kraut, green apples, green corn, are the articles

possessing the greatest remedial and preventive properties, and are named in the order of their comparative value. In administering these articles care should be exercised that the digestive functions are not disordered. To prevent this the patient should be allowed as a part of each meal, meat, eggs, milk, etc. (No. 30) should be given, a teaspoonful before each meal:

No. 30.

℞

Quiniae Sulph.	ʒ ss.
Tr. Capsici	gtts. x.
Tr. Ferri mur.	fl. ʒ ij.
Aquae dist. q. s. ad	" ʒ iv.

M.–Sig.:—ʒ j three times a day before meals.

VALVULAR DISEASE OF THE HEART.

From the anatomical description of the heart, given in Part First, it will be learned that it has four sets of valves, formed mainly by folds of the lining membrane (endocardium) of this organ. The office of these valves is—as in hydraulics—to permit the flow of blood in one direction and prevent it in the opposite. These valves from various causes become impaired, and then valvular or organic disease of the heart is said to exist. These affections (lesions) are recognized by the physician by characteristic sounds called *murmurs*. It is not within the scope of this work,—as before stated in the introductory,—to consider at length incurable diseases, and for this reason we shall not attempt to instruct our readers how to recognize "heart murmurs." It would not be of material benefit to them were they able to do so, as the affection is irremediable.

It is often the case that serious results follow valvular lesions of the heart, but in a large majority of instances no considerable inconvenience is experienced. Probably not twenty-five per cent. of those having this affection are

ever cognizant of the fact, and those who are go about their daily avocations with very little annoyance therefrom.

The writer has had a valvular affection of the heart for more than twenty-five years, and is happy to state that at no time within his remembrance has he been in better health than at present. We make this statement in order to emphasize the point, that valvular disease of the heart is not so grave an affection as is generally believed. It is a matter of regret that there are medical practitioners so unscrupulous and dishonest, as to encourage the belief that a valvular difficulty of the heart is next door to death. They spare no effort to convey the impression that the affection is of the most serious nature, and if they succeed —as they often do—in making their patients believe this, then with equal zeal endeavor to persuade them that an infallible remedy is at hand, and they are the *only* possessors of the priceless discovery. We advise our readers to have nothing to do with such pretenders. The man, that unknown relieves you of your pocketbook, or its contents, while you sleep the sleep of the just, is a gentleman beside such unprincipled charlatans. If you suspect that you have an affection of this nature, consult a specialist of known *ability* and *honesty*, and do not begrudge his fee, if he tells you that your case does not call for medicines, but merely an exercise of the judgment in reference to those things that have an undue influence upon the heart's action. If you know that you have "heart disease," and wish something to steady and regulate the action of this organ, you can get nothing better than (No. 31) which should be taken in teaspoonful doses every four, six or eight hours, as is required to give relief.

No. 31.

℞

Fl. Ext. Lily of the Valley (P. D. & Co.). fl. ʒ ij.
Syrup Simp..... " ʒ vj.
Aqua q. s. ad..... " ℥ ij.

M.–Sig.:—ʒ j every 4, 6, or 8 hours, as required.

This, with proper hygienic treatment, consisting of a well-regulated diet, moderate exercise in the open air, a proper amount of sleep and abstinence from all excesses, will in a majority of cases give relief.

FUNCTIONAL DISEASE OF THE HEART.

A large per cent. of heart disorders come under this head, and are usually spoken of as "sympathetic affections." In this connection, we wish to explain that "*palpitation of the heart*" is not a disease, but a symptom. It occurs in both organic and functional diseases of the heart, and varies much in character and intensity; at times consisting of a mere fluttering, and in other instances of a violent action of the heart, attended with excruciating pain and a sense of suffocation. Palpitation is the chief symptom of functional disorders of the heart, and usually occurs in paroxysms, which are variable as regards frequency of occurrence and duration.

Palpitation occurring in paroxysms, the action at other times being regular; the attack occurring oftener at night than in the daytime; the patient being able to take muscular exercise without inducing an attack; the paroxysms coming on without any apparent cause; are the points which render it very probable that the difficulty is functional rather than organic. As a rule patients in functional heart difficulty are apprehensive as to their condition, often expressing fear of sudden death. This is the exception in organic affections.

Cause.—Functional disease of the heart is common in certain nervous conditions, as hysteria, and spinal irritation; it is also a result of sexual excess and masturbation; anæmia is a frequent cause. Mechanical interference with the heart's action—as in tight lacing, a distended stomach or colon, is a common cause. A not infrequent cause is the excessive use of tobacco, tea or coffee.

Treatment.—Look for the cause, and if found, remove

it; if arising from anæmia, the measures recommended under treatment of that affection will be appropriate; if from indigestion—a very frequent cause—the diet must be regulated, especially must all articles known not to agree with the stomach be discarded; all excesses must be avoided. If from tobacco, tea, etc., their use must be abandoned, or very much moderated.

As a temporary relief from palpitation, the inhalation of spirits of camphor or ammonia, often gives relief. Fifteen to thirty drops of the *aromatic spirits of ammonia* in half a wine glass of water is also good, or *Hoffman's anodyne*, one-half to one teaspoonful in sweetened water, gives relief. If paroxysms occur often, wear over the region of the heart a ***belladonna plaster.***

The danger from functional disorders of the heart is extremely small, and *never* leads to organic affections.

NEURALGIA OR SPASMS OF THE HEART. (*Angina pectoris.*)

This affection properly belongs with nervous diseases, but inasmuch as the pain is located in the region of the heart, and is closely connected with disorder of this organ, we shall consider it in this place.

This disease is characterized by sudden and acute excruciating pain in the region of the heart. The pain is tearing or lacerating in character, and radiates in different directions, especially toward the left shoulder and arm—and sometimes both—and occasionally extends to the forearm or back.

Paroxysms differ greatly, not only in regard to severity but as to their duration and frequency of occurrence also. The attack is attended usually—not always—with difficulty of breathing, and a sense of impending danger; there is cold, clammy perspiration, and great anxiety of countenance. The patient remains quiet, dreading to move for fear of increasing the pain; the surface is gener-

ally pallid, occasionally the opposite. The disease usually occurs in connection with organic affection of the heart, but may occur independently of such difficulty.

Treatment.—During the paroxysms treatment should be with a view to giving relief. A mustard plaster placed over the heart is a good external application; while this is being prepared, rub the chest in the region of the pain briskly with the palm of the hand. A teaspoonful of brandy or whiskey, taken clear, will often give relief. The inhaling of ammonia or camphor is beneficial in some cases. The *aromatic spirits of ammonia*, 20 to 30 drops in a tablespoonful of water, is also useful. If it is known that the paroxysms continue for any considerable length of time it is best to give 15 to 20 drops of the *deodorized tincture of opium* as soon as the attack begins. Persons subject to attacks of angina pectoris should carry with them on all occasions the remedy which they have found by experience to give relief quickest.

The treatment to prevent the attacks should be left to the medical attendant. Everything which tends to provoke an attack should be avoided, such as active exercise, mental excitement, over-eating, and the abuse of stimulants. Angina pectoris is a grave affection, but fortunately is of rare occurrence.

EXOPHTHALMIC GOITRE.

This affection is peculiar, and once seen will always thereafter be readily recognized. The striking peculiarity is the protrusion of both eyeballs. This is often to such extent that the whites of the eyes are largely exposed. In connection with the above special feature there is enlargement of the thyroid glands and an increased action of the heart. There is more or less short-sightedness, but no pain in the eyes. There is invariable anæmia present.

The disease is of rare occurrence. The causes are

unknown, but undoubtedly are closely connected with the functional nervous disorders.

Treatment.—Should be placed in the hands of an experienced medical man.

INFLAMMATION OF THE HEART SAC.

(*Pericarditis.*)

Pericarditis is an inflammation of the sac (pericardium) surrounding the heart. The result of inflammation of this membrane, as with all others which are of a serious character, is the effusion of liquid from the internal surface of the sac. The accumulation of fluid within the pericardium interferes with the movements of the heart, and endangers life to a more or less degree, corresponding to the amount of liquid thus effused.

Causes.—This disease may arise from mechanical injuries, but is usually the result of a contaminated state of the blood, produced by other diseases, notably articular rheumatism, Bright's disease, scarlet fever, and some others. The affection is developed in connection with articular rheumatism oftener than in any other, occurring in about one case out of six.

The diagnosis of pericarditis is made from physical signs, and should be left to the family physician, as should also the treatment. Inflammation of the lining membrane of the cavities of the heart is called *endocarditis.* It occurs in the left side oftener than the right, and from this and the fact that the disease attacks the valvular apparatus more frequently than the general tract of the membrane, is explained why the mitral valves are diseased oftener than those of the opposite side of the heart.

This affection generally occurs in connection with articular rheumatism, though it may appear independent of other diseases. The danger in endocarditis is small, being in this particular a remarkable contrast to pericar-

ditis. As regards diagnosis and treatment, we repeat the advice given under the affection just previous to this.

RUPTURE OF THE HEART.

The question is frequently asked the physician, Does the heart ever rupture? It is understood, of course, that the question refers to spontaneous rupture, and not to the bursting of the heart resulting from mechanical force.

A healthy heart never ruptures, no matter how great the strain. On the other hand if the heart be diseased it may burst from over-action or strains of other kind.

The most common cause of rupture of the heart is *fatty degeneration*, a condition of the muscular fibers, destroying their powers of resistance.

VARICOSE VEINS.

This term is applied to enlarged tortuous veins occurring upon the surface of the lower extremities. This condition is recognized from the enlargement, which is soon increased if a bandage be placed between it and the heart. An early symptom of the disease is aching of the limbs on standing or after exercise. After this affection has existed for some length of time the bluish color peculiar to veins will make the diagnosis plain.

Causes.—The affection is due to an impeded circulation.

Treatment.—In the early stage this disease is very amenable to treatment, but later on it is one of the most obstinate, and while relief is certain a cure is the exception.

Nothing equals a well fitting elastic stocking for varicose veins. The recumbent position should be maintained for three or four days previous to measuring the leg for a stocking.

BLOOD POISONING.

By this term is meant a condition of the blood which has been produced by morbid materials getting into it,

either by way of the veins or absorbent vessels (*lymphatics*). If an individual is affected by a wound and it becomes unhealthy (does not heal, or is not kept cleansed) the decaying tissue is apt to be taken up by the veins returning from it to the heart, and in a short time the blood of the entire system is contaminated. The same may occur in certain diseases accompanied by local inflammation, as in diphtheria, deep-seated erysipelas. The fever sometimes following confinement (puerperal fever) is another example of this condition, and is due to the absorption of putrid inflammatory products. Blood poisoning when followed or resulting from local inflammation, as in the last named instances, is called *septicæmia*, and when following wounds, *pyæmia*. In the latter case abscesses are likely to form in other parts of the body, as the lungs, liver, kidneys, etc. The severity of the attack of this affection is in proportion to the amount of morbid matter absorbed. A small wound may, however, be the starting point of severe blood poisoning.

Symptoms.—Chills of more or less severity, sudden changes in temperature, profuse sweating attended by great depression occurring in the course of other affections, as above described, most positively indicate blood poisoning.

If an internal organ is involved in this disease, the result is most always fatal. On the contrary, if the skin or extremities are attacked, recovery may be expected. When blood poisoning follows wounds resulting from injury or operation, it can be predicted previous to the symptoms above enumerated from the appearance of the wound, which changes in appearance ; the surface becomes glazed or possibly assumes sloughing action ; the discharge bloody and fœtid ; the skin around the wound becomes red, or may acquire a peculiar dusky leaden appearance which is characteristic of this affection. If the brain be attacked there will be delirium of a low, mut-

tering kind; profound sleep from which it is hard to arouse the patient; in rare cases the delirium is of the acute form. The affection may terminate fatally in two or three days after the first appearance. Bad cases usually terminate during the second week; some go on much longer. The longer a patient lives the greater the chances of final recovery.

Treatment.—Both as a preventive and a remedial measure, fresh air stands first and cleanliness next. These agents, in connection with a nutritious diet, very much diminish the chances of an attack and greatly increase the probabilities of recovery if the disease has commenced.

Milk is the best food, and may be combined with egg, and in occasional cases it may be necessary to combine stimulants with it. This, however, should be with caution, and the amount regulated by the wants of the individual. When the patient is addicted to the use of alcohol, it will be much more likely to be called for than in those who have not the habit.

Diarrhœa occurring in the course of this affection, should not be checked too suddenly, as it seems to be an effort of nature to carry the poison out of the system. We do not advise our readers to treat the disease without the aid of a physician, but have endeavored to make it possible for them to recognize it. Blood poisoning occurs occasionally in the course of unimportant wounds or sores. In these cases it may be the medical attendant—if called at all—does not deem it necessary to make visits only at long intervals, and the disease may have gotten a thorough hold of the patient before any great thought is given to the matter. The writer was once called to attend a gentleman suffering—so the messenger said— with rheumatism. Upon arrival at the bedside, instead of rheumatism, he found symptoms of blood-poisoning of unusual severity. The patient had a carbuncle upon the nape of the neck, which the friends considered unimportant, and its exist-

ence became known only through seeking a cause for the symptoms which were at first unexplainable. The patient died within forty-eight hours from the time we first saw him. He had had soreness of the joints with chills and profuse sweating for several days before calling medical attendance. There is every reason to believe that this sad result could have been avoided had the friends possessed the knowledge of diseases and their symptoms, which it is possible for every intelligent person to gain.

CHAPTER VIII.

DISEASES OF THE DIGESTIVE ORGANS.

CANKER SORE. (*Follicular Ulcer of the Mouth.*)

This term is used to designate a small sore of the mouth, caused by the stoppage, swelling and ulceration of the mucous glands, which are very numerous on the inner surface of the lips. It will not be necessary to enter into a description of this affection, as there are very few individuals but have suffered from it more or less. It is very liable to occur in some females at the menstrual period, during pregnancy and lactation. The remote cause is some disturbance of digestion.

Treatment.—For the stomach, take

No. 32.

℞

Quiniae Sulph.	ʒ ss.
Tr. Capsici	fl. ʒ ij.
Tr. Nucis Vom	" ʒ ij.
Tr. Rhei	" ℥ ss.
Syrup Simp. q. s. ad	" ℥ iv.

M.-Sig.:—ʒ j three times a day before meals.

For a local application use *fifty per cent. nitrate of silver pencil,* which can be procured at the drugstore. If this is not obtainable, use full strength. Sharpen the end of the pencil and apply lightly to the bottom of the ulcer. This treatment is rather painful, but as it lasts but a minute, and is very effectual, the reader will not regret

using it. For children 10 to 20 grains of powdered *chlorate of potassa* to an ounce of water can be used as a wash.

MERCURIAL SORE MOUTH. (*Ptyalism.*)

This is more commonly known as calomel sore mouth. The affection is of rare occurrence at the present day as compared with a quarter of a century ago. In certain localities, however, where malarious diseases are prevalent (notably the Southern and Southwestern States), it is still the practice to give calomel, and this form of sore mouth is met with.

The symptoms as given in the U. S. D., "Are a coppery taste in the mouth, a slight soreness of the gums, and an unpleasant sensation in the sockets of the teeth when the jaws are firmly closed. Shortly afterward the gums begin to swell, a line of whitish matter is seen along their edges, and the breath is infected with a peculiar and very disagreeable smell called the mercurial fetor. The saliva at the same time begins to flow, and if the affection proceeds the gums, tongue, throat and face become much swollen; ulcerations attack the lining membrane of the mouth and fauces; the jaws become excessively painful; the tongue is coated with a thick, whitish fur, and saliva flows in streams from the mouth."

Treatment.—Use for a wash and internally No. 33, by taking a tablespoonful every four hours, and using sufficient of the same to wet the gums and mouth thoroughly,

No. 33.

℞

Potassa Chlorat (pulv.)..... ʒ iij.
Aqua..... fl. ʒ viij.

M.–Ft. solution. Sig.:—Use as directed.

Excessive secretions of saliva occur from other causes than the action of mercurial compounds upon the system.

These causes are not always apparent, but without doubt the majority of cases are dependent upon a diseased stomach, or to irritation in some other portion of the body, as in gastric ulcer, worms in the intestines, etc. In severe cases the quantity of saliva secreted is so great that the patient is obliged to spit constantly, the escaping fluid amounting to six or eight pints in twenty-four hours.

Treatment.—The disease upon which excessive secretion depends should be remedied. As a temporary relief, use a wash of strong sage tea to which has been added a piece of alum about one-half inch square to a teacupful of the tea.

THRUSH.

Thrush is due to a parasitic plant which grows upon the mucous membrane of the mouth. It occurs mostly in children during the first weeks of life. Very rarely this affection attacks adults, and only in exhausting diseases a short time before death. The first indication of thrush in children is the evident pain in nursing. If the mouth be examined whitish points will be found on the inner surface of the lips, roof of the mouth, and tongue. In severe cases a cheesy mass is found in the positions mentioned. This accumulation is easily removed at first, but as the disease advances it is more firmly attached.

Treatment.—If the baby's mouth be washed twice daily with No. 34 there will be very little danger of thrush making its appearance:

No. 34.

℞

Sodii Hyposulphis.....	grs. ij.
Aqua	fl. ℥ ij.

M.-Ft. solution. Sig.:—Use as directed.

The utmost gentleness must be used in washing the baby's mouth, or more harm than good will result. Only the very softest linen rag should be used, and the same

piece but once. It is better that it should *not* be done than done roughly.

APHTHÆ.

This disease very closely resembles the one last treated; it occurs somewhat later, the most frequent time being the period of "cutting" the temporary teeth. The location in the mouth is the same as in *thrush*, viz., roof of mouth, anterior portion of tongue and inner surface of lips.

The mucous membrane surrounding the spots is of a deeper red. This is not noticed in thrush. If the deposit is removed, the surface underneath is *not* ulcerated, which will make it plain that the affection is not diphtheritic ulceration. A day or so previous to the appearance of *aphthæ* there will be more or less fever, restlessness, loss of appetite, and indications of sore mouth.

Treatment.—Take Turkish rhubarb root, and grate one teaspoonful, place in a cup and pour over it four tablespoonfuls of boiling water, cover, and allow to simmer for thirty minutes, strain and give a teaspoonful, to which has been added one drop of essence of peppermint and a little sugar, every hour until the bowels are evacuated, then give (No. 35), a teaspoonful four times a day.

No. 35.

℞

Potass. Chloras..... ʒ ijss.
Aqua..... fl. ʒ iv.

M.-Ft. sol. et sig.:—ʒ j four times a day.

This affection may last for weeks, but is not dangerous of itself.

SORE MOUTH.

Under this head we wish to treat of certain affections of the mouth which frequently occur, especially during the summer and fall months, but cannot properly be

classed under any of the diseases. In the condition to which we refer, there is more or less inflammation of the mucous membrane lining this cavity and covering the tongue, indicated by tenderness, pain caused by chewing or swallowing, and a deep red color of the affected part. The symptoms are very similar to that caused by taking into the mouth scalding liquid. The cause of this affection is not always clear. In many instances, however, it is due to some particular article of diet, more commonly from the fruits or vegetables, and in certain cases the disorder seems due to the article of which the individual is fondest.

A plausible explanation of this is that too great a quantity is eaten, and as a result digestion is impaired which in turn gives rise to the affection of the mouth.

Treatment.—The diet must be regulated, and to correct the stomach difficulty, take No. 32 as directed under *canker sore mouth.* As a local application, use No. 36.

No. 36.

℞

Pulv. Alum	ʒ ij.
Pow'd Ext. Hydrastis can. (*P. D. & Co.*)	ʒ iv.
Nymph. Adorata (*White pond lily root.*)	ʒ ij.

M.–Sig.:—Use as directed.

This can be applied dry to the affected part, or by adding a teacupful of boiling water to one-half teaspoonful of the powder, and allow to stand in a warm place for thirty minutes.

SORE THROAT. (*Pharyngitis*).

This affection, is an inflammation and is indicated by the same series of symptoms as in other localities, viz., *swelling, heat, redness, and pain.* Pharyngitis may be *acute* or *chronic.*

In the acute stage it constitutes one form of what is commonly spoken of as "a cold." There is pain in

swallowing, and the patient is annoyed by a constant desire to swallow. The inflammation extends more or less over the surface of the throat and into the back part of the nose. The reddened mucous membrane is at first dry, but in twenty-four to forty-eight hours is covered with secretion which causes hawking and spitting. In about half the cases there is coughing, and from its character, is referred to as "coming from the throat."

Treatment.—The bowels should first be freely acted upon by using either Seidlitz powders or epsom salts, then take two grains of quinine every three hours for three to four days and then four times a day for an equal length of time. Use as a gargle four times a day

No. 37.

℞

Potass. Chloras	ʒ iv.
Tr. Ferri mur	fl. ʒ j.
Glycerina	" ʒ jss.
Aqua q. s. ad	" ℥ iv.

M.-Sig.:—Use as a gargle.

CLERGYMAN'S SORE THROAT.

(*Chronic Pharyngitis.*)

This affection, known as clergyman's sore throat, is extremely common, existing in various degrees of intensity and from its occurring frequently amongst the clergy, it has been named as above. It, however, does not occur oftener in this profession than in other callings. Public speakers and singers who suffer from this disease are apt to be apprehensive lest it may incapacitate them from appearing in public. There is little danger of this, as the use of the voice does not cause the affection. The disease is most frequent in individuals who are employed in vocations which keep them within doors, and require close application, with little or no recreation.

Symptoms of dyspepsia frequently are present; palpitation is not uncommon; the injudicious use of wraps for the neck and throat is an exciting cause. The wearing of a neck wrap one day and leaving it home the next, is a bad practice, unless you desire to use the prescriptions accompanying this volume in a much shorter period of time than is intended by the writer. The protection for the neck and throat should be adequate, but of such weight and material, that it is adapted to *everyday* use during the season it is required. This advice is intended for both males and females.

Treatment.—It must be borne in mind that this is a *chronic* affection, and necessarily treatment must be persistent. Hygienic regulations, as regards exercise, ventilation, diet and recreation, should receive proper attention. As a gargle use No. 38, night and morning.

No. 38.

℞

Potass. Bromide ..... ʒ j.
Fl. Ex. Hydras. Can. (*non-alco.*) *P. D. & Co.* fl. ʒ j.
Aqua dist. q. s. ad ..... " ʒ xvj.

M.–Sig:—Use one tablespoonful night and morning as a gargle.

In addition to this, take internally of No. 39, a teaspoonful in soft water three times a day for two months.

No. 39.

℞

Tr. Guaiaci Am. .....
Tr. Cubebae ..... } aa. fl. ʒ j.
Syrup Senegae .....
Syrup Simp .....

M.–Sig.:—ʒ j in soft water three times a day.

If this treatment is followed closely for two to three months we have no fear that the reader will regret the purchase of this volume.

QUINSY. (*Tonsillitis.*)

Acute tonsillitis is known as quinsy, and is characterized by rapid swelling of one or both tonsils, attended with pain and redness. There is difficulty in swallowing, which is very painful. By pressing down the tongue the swollen tonsil can be readily seen. If both tonsils are affected, the throat appears to be closed. There is more or less fever, and the skin is hot and dry. Many persons in early life seem to be subjected to attacks of tonsillitis.

Causes.—Exposure to cold and getting the feet wet, are causes to which an attack of this affection is often attributable. In many cases the cause is not obvious.

Treatment.—Act freely upon the bowels by using either castor oil, epsom salts or *compound cathartic pills.* As soon as the bowels move, give full doses of quinine every three hours. By a *full* dose, is meant the maximum number of grains for the age of the patient.

For local treatment, apply with a swab No. 40. Care should be taken that the application is made well down into the throat; adults can often make the application themselves better than an attendant. A deep inspiration should always be made before introducing medicine into the throat, as expiration will be the next respiratory act, and any material which does not adhere to the parts, is carried out, rather than into the lungs. In children, who are too young to follow directions, advantage should be taken of this point and apply the remedy immediately after the inspiratory act. Advantage should also be taken of the act of "gagging," and push the swab well into the throat, giving it a movement from side to side.

No. 40.

℞

Potassa Chlor ..... ʒ j.
Tr. Ferri mur ..... fl. ʒ j.
Glycerina q. s. ad ..... " ʒ j.

M.–Sig.:– Use as directed.

Warm fomentations to the outside of the throat are beneficial; mustard plaster applied till the surface is reddened is about the best. Individuals who are apt to be attacked by this affection, can often prevent it by using (No. 40), just as soon as the first indications are noticed, and by wrapping the throat in a cloth wet with cold water, over which are placed other layers of dry cloths.

In children, where there is much fever with heat of the head, No. 41 should be used as directed.

No. 41.

℞

Tr. Aconiti ..... gtts. v.
Aqua pura ..... fl. ʒ iv.

M.-Sig.:—ʒ j every fifteen to twenty minutes to allay fever.

CHRONIC TONSILLITIS

Is a chronic enlargement of the tonsils. This is frequently present in children as well as adults, who live in localities where there is much malaria. It is quite frequently the case that enlargement of acute tonsilitis remains.

This affection can be recognized if the enlargement is to any extent, by the peculiar nasal twang in speaking, and the distressing snoring during sleep.

Treatment.—Apply twice a day to the enlarged tonsils

No. 42.

℞

Potass. Brom ..... 3 j.
Tinct. Ferri mur ..... fl. ʒ ij.
Glycerina ..... " ʒ j.

M.-Sig.:—Use as directed.

Internally, the treatment must be in the line of tonics. If the patient is anæmic, the remedies advised when treating of it should be used. *Emulsion of cod liver oil* is very applicable to cases when there is cough. Iodine should be put into a perforated box, and kept standing in the sleep-

ing room. The gradual evaporation of the iodine has a beneficial effect. Alternating with cod liver oil, No. 43 should be given.

No. 43.

℞

Quiniæ Sulph	3 ss.
Ext. Glycyr. fluid	fl. ʒ j.
Syrup Simp	" ʒ iv.

M.–Sig.:—3 j three times a day before meals.

If the tonsils appear white and hard, the hopes of curing them by medication have disappeared, and a surgeon should then be consulted as to having them removed.

MUMPS. (*Parotiditis.*)

Mumps is an inflammation of one or both parotid glands, due to a specific poison which is communicable by contagion. The affection most always occurs as an epidemic, and usually in the autumn or spring.

It generally commences with a chill, or chilly sensation, followed by slight fever, headache, and loss of appetite. In about thirty-six hours, as a rule, swelling of the parotid gland begins, in which the surrounding parts partake; there is soreness to the touch, pain, especially in chewing, which extends into the ear. There is little or no redness of the skin. If both sides are affected, there is usually one or two days intervening between the two attacks.

Persons between eighteen and thirty years of age are most susceptible to the disease; males are attacked oftener than females. There is no danger of the inflammation extending to other localities. The mammary glands in females and testes in males, occasionally begin to swell about the time the inflammation leaves the parotid glands, which leads to the belief that the disease has left one gland to attack another. This is incorrect. The swelling of the glands is due to the same internal morbid condition which gave rise to the enlargement of the parotid gland.

Treatment.—The patient should remain indoors; diet should be light and easily digested; the swollen parts kept wrapped in flannel or cotton wool. As a soothing remedy, if desired, bathe parts with No. 26.

The common idea that "taking cold" is a serious matter is erroneous; the disease ends in four to eight days without *any* bad results.

INFLAMMATION OF THE STOMACH.

(*Gastritis.*)

Acute inflammation of the stomach is an extremely rare affection excepting when produced from taking irritating substances into the stomach, such as carbolic acid, aquafortis, oxalic acid, etc.

It is generally known whether such substances have been introduced into the stomach, therefore it is not necessary to give the symptoms here, as they will be mentioned at length under poisons. The drinking of a large quantity of cold water has caused the disease, as has also over-eating of highly seasoned food, common forms of intemperance, but which do not entail to the sufferer and his friends as great public censure as alcoholic intemperance. Insulted nature, however, is no respecter of persons, and gastritis, from whatever cause, is attended with the same serious results. This disease is apt to follow a debauch, and prove fatal.

Symptoms.—There is intense burning pain in the stomach, attended with nausea and vomiting. The pain is increased by inspiration, vomiting is produced if food is taken into the stomach, many cases not even tolerating water. Thirst, however, is great. There is marked tenderness over the region of the stomach. The pulse is increased in frequency. The temperature is moderately raised. The countenance is anxious and haggard. The extremities are cold, and in many cases hiccough

occurs. Death may occur in twenty-four hours or after the lapse of several days, the result depending upon the extent of injury caused by the irritating substance swallowed.

Treatment.—If caused from swallowing any irritating substance the treatment should be followed given in chapter on poisons. If resulting from a debauch the patient should be kept in bed, and efforts made to arrest vomiting. Ice cold milk and lime water, in teaspoonful doses, given at short intervals, is very beneficial. To arrest vomiting when following a debauch, nothing is better than the *one drop* doses of Fowler's solution.

GASTRIC FEVER.

This term is used to indicate a febrile action resulting from a mild inflammation of the mucous membrane of the stomach. It is also called erroneously catarrh or catarrhal inflammation of the stomach.

The symptoms vary according to intensity of the inflammation. The appetite is impaired, eating is followed by more or less distress of the stomach, flatulence, and belching of gas. Thirst is a prominent symptom. The tongue is furred. As a rule, constipation exists. There is pain in the head and fever.

The above symptoms are those present in a mild case, lasting two to five days, and usually caused from partaking too largely of highly seasoned food, and requiring as treatment complete abstinence for twenty-four hours, and for a few days thereafter a limited amount of milk with limewater and farinaceous articles. In cases of greater severity, the symptoms noted above are intensified, and the affection continues from one to three weeks, and may become chronic. These severe cases mostly occur in persons who habitually indulge in the free use of alcoholic drinks, a prolonged debauch preceding the attack.

Treatment.—The patient should be kept in bed; cold

applied to the head, and mustard to the skin over the stomach. To allay the pain and arrest vomiting, give No. 44 in a teaspoonful of milk every three to four hours.

No. 44.

℞

Bismuthi subcarb..... 3 j.
Morphiae Sulph..... gr. j.

M.–et div. into pulv. No. xii. Sig.—One powder every three to four hours as required.

To allay the thirst small pieces of ice may be swallowed or held in the mouth till melted. After twenty-four to forty-eight hours of abstinence from food, take equal parts of limewater and fresh milk, and begin with teaspoonful doses every hour, and if well borne by the stomach increase gradually to two tablespoonsful, and then lengthen the time of giving to two hours. In beginning with other articles of diet the quantity should be small at the first.

SICK HEADACHE.

Sick Headache, bilious headache, acute dyspepsia, are names indicating the same affection. Sympathetic headache is a term that defines more closely the nature of the pain than either of the above. We shall, however, use the name sick headache, as the disease is more generally known by it than any other. There is hardly any disease in the list of human ailments which is more universal or has caused more suffering than this. It is *never* fatal, and for this reason does not receive from medical men the attention that it otherwise would. Individuals suffering from this affection, in many instances, receive but little sympathy. The friends see them pass through oft-repeated attacks, until it becomes quite common to refer to the indisposition as "*nothing* but the sick headache," a remark which if it reaches the sufferer's ears, is very apt to cause a wish which it is hoped the Recording Angel will not make minute of.

Symptoms.—There is always pain in the head, located in the frontal region, the point of greatest severity being just above the eyes. The pain is frequently confined to one side of the head. The time and manner of the attack varies with different individuals, but the majority of those who may be considered subject to the disease are prostrated by the affection at times when least expected, and under most inopportune circumstances. If the headache comes on in the waking hours, the first indication—and one that the individual learns to recognize as prophetic of an attack—is a sensation of the eyes described variously as "blurring," "flickering of the eyes," "floating of dark or bright spots in front of the eyes," etc.

Pain soon begins, which is increased by light, and in many cases by noise; a sense of cold and chilliness is felt about the scalp and face; the hands and feet are cold; the pain increases in severity, and soon nausea commences. These symptoms continue—varying in intensity in different attacks—from a few hours to a day or two. If vomiting occurs, the pain often disappears as if by magic. This is not always true, still there are very few cases but are relieved to a greater or less degree. Many patients are greatly relieved by sleep, though it be only a few minutes' duration. The tongue is furred; the urine is high colored, and increased in quantity. The vomited matter in addition to the food, consists of a viscid mucus.

Causes.—If the sympathetic symptom of nerves is studied, it will be learned that an intimate communication exists between the stomach and brain, and explains why the head aches in this affection, which is properly a disease of the stomach. The condition of the stomach, which gives rise to the pain in the head, is not in all cases the same. It may be caused by inactivity of this organ, or the opposite. We have observed that persons who are disposed to attacks of sick headache invariably suffer from constipation.

The majority of cases are, without doubt, dependent upon a *weakened* digestion, which in turn is due to causes that are somewhat different in each individual, hence remedies which are effectual in some cases, are almost valueless in others.

Treatment.—This must be with a view to relieving the attack when present, and to prevent a recurrence. At the very first indication of an attack it may often be avoided by the use of certain agents. The following have all been tried and are successful in a majority of cases: A cup of *hot water;* strong black or red pepper tea, using ten to twenty whole berries of the former and a few grains of the latter to a cup of boiling water, and drinking as soon as cool enough; fifteen to twenty-five drops of *aromatic spirits of ammonia* in a wine glass of water; peppermint and water; the juice of an orange. After the pain has commenced the treatment should be confined to measures of relief.

The room should be darkened, mustard applied to the pit of the stomach and back of the neck, warm applications to the extremities, and give one drop of *tincture nux vomica* in a teaspoonful of water every fifteen minutes until six or eight drops have been taken. If the headache comes on soon after a meal, No. 45 will be of much benefit.

No. 45.

℞

Pepsin Cordial. (*P. D. & Co.*)... fl. ʒ iij.

Sig.:—One or two teaspoonfuls after each meal as may be required.

In early life an emetic is almost sure to relieve, and inasmuch as children vomit with less retching than adults, it is advised that means be employed to procure a thorough evacuation of the stomach. A cup of tepid water, salt and water, or mustard and water, tickling the fauces, can be used with success. Twenty grains of *ipecac* mixed in a half cup of water, will in most cases cause free vomiting

(see vomiting). To prevent recurrence of sick headache, it is necessary to look well to all measures which tend to tone up the digestive system, such as exercise in the open air, frequent and regular bathing, a restricted diet—all articles of food that are known to disagree with the stomach must be interdicted—regularity as to time of eating is of the *greatest importance;* the hour for retiring should be fixed and persevered in. Late hours and suppers are bad for any one, but especially so for those subject to sick headache.

The bowels *must* be regular, or all means for preventing this affection will be futile. For remedies to relieve constipation, see remarks under that head.

DYSPEPSIA.

Dyspepsia is the name applied to functional disorder of the stomach, and means literally difficult digestion. *Indigestion* is used to indicate the same morbid condition. The affection may be either chronic or acute.

In order to better understand this subject, the reader should first become familiar with the physiology of digestion in all its various parts, so thoroughly described in Part First of this volume. From it will be learned that the act of digestion is not confined to the stomach, as was supposed at one time, but continues throughout nearly the entire length of the alimentary canal; if we make absorption a part of, or accessory to the act, we may say the *whole.*

Acute dyspepsia is popularly known as a *bilious attack;* a term which is objectionable, as it implies that the attack is connected with liver disturbance, an inference not borne out by facts. The *causes* of acute dyspepsia, "are overrepletion of the stomach, the eating of indigestible articles of food, or an arrest of digestion by strong emotions, fatigue or other causes."

The *symptoms* are weight, fullness or pain in the region

of the stomach, accompanied by nausea, and sometimes vomiting, a general ill-feeling and a slight febrile action. These symptoms are followed by loss of appetite, coated tongue, an unpleasant taste of the mouth, and in some individuals looseness of the bowels, oftener constipation. The liquid vomited often contains bile. This no doubt has led to the belief that the disease was due to a surplus of this secretion. A moment's study of engraving No. 11 will show that the bile is emptied into the digestive tract some little distance below the stomach, consequently cannot be present in it, except as it is forced there by the act of vomiting.

Treatment.—Persons subject to attacks of this disorder are apt to fall into the habit of taking large doses of cathartic medicine. This is not necessary. One *compound cathartic pill* at night followed in the morning by a *Seidlitz powder*, or a little *epsom salts* is sufficient. After a mild evacuation, a couple grains of quinine, three times a day, for a short time, with regulated diet, are all the measures of treatment required.

Chronic Dyspepsia, or Indigestion.—Though never proving fatal, chronic indigestion is one of the most annoying diseases that humanity is subjected to. Of it, Carlyle wrote, "The accursed hag, dyspepsia, had got me bitted and bridled, and was ever striving to make my living, waking day a thing of ghastly nightmares."

Digestion is properly a process of solution requiring previous disintegration; hence it follows that indigestion is due either to imperfect disintegration or defective solvent power. Imperfect disintegration is mainly caused by insufficient mastication. This defect lies either in the practice of eating hurriedly, or bad teeth; the former is to be condemned without extenuating circumstances; the latter should be remedied by a visit to a first class dentist. Bad teeth not only forbid perfect mastication, but the pain incident thereto, often causes the food to be

bottled, even when the individuals know full well they will suffer for it.

Imperfect solvent action may result from impairment in the saliva, the gastric juice, or the pancreatic secretion. These defects must be met by the administration of remedies for increasing the flow of these secretions, or adding to their solvent powers.

Symptoms.—The prominent symptoms of dyspepsia, are regurgitation, cardialgia, tympanitis and vomiting.

Regurgitation, raising or "spitting up" portions of the food, is a common symptom in dyspepsia. The regurgitated liquid is usually sour, and is often flavored by the articles of food which have been eaten. For this condition we advise

No. 46.

℞

Tinct. Columbae ..... fl. ʒ j.
Aqua q. s. ad. ..... " ʒ iv.

M.-Sig.:—3 j before each meal.

And immediately after meals take of No. 45 as prescribed.

When the liquid is clear, or nearly so, saltish or brackish, sometimes acid, and the regurgitation occurring when the stomach is empty, usually in the morning, it is called water-brash, and for which, take

No. 47.

℞

Bismuthi subcarb. ..... ʒ iv.

Div. into pulv. No. xxiv.

Sig.:—One powder in a tablespoonful of water or milk three times a day before meals.

Cardialgia signifies pain at the portion of the stomach nearest the heart. It is of a burning character, shooting into the chest and up the œsophagus to the throat; this condition is vulgarly known as *heart burn*, and for its relief, take

No. 48.

℞

Tinct. Gentianae	} aa. fl. ʒ j.
Spts. Am. Ar.	}
Aqua q. s. ad.	" ʒ iv.

M.–Sig.:—ʒ j one hour after meals.

Tympanitis.––By this term is meant the accumulation of gas, either within the stomach or small intestines. A simple remedy for the relief of this is fifteen drop doses of *essence of peppermint*, in a little sweetened water; if this does not correct the trouble, use prescription No. 49, taking one pill before each meal:

No. 49.

℞

Pulv. Ext. Nucis Vom. (P. D. & Co.)	grs. ij.
" *Rhei*	" xij.
" *Ipecac*	" vj.
" *Capsici*	" ij.

M.–et div. in pilulae No. xij.

When the food is vomited unchanged, or only partly so, it indicates that the gastric juice is deficient, and calls for a remedy to supply the want. No. 45 will be found a very efficient remedy for this condition. Limewater and milk, in the proportions of one of the former to three of the latter, is an excellent remedy for vomiting in dyspepsia, when there is great acidity of the vomited matter. We have endeavored to meet the various conditions of indigestion by different prescriptions. It will be understood, without demonstration, that an attempt to meet all these conditions by the same prescription would be the height of folly. The same is true in reference to prescribing a line of diet; there are no rules suited to all cases. Individual experience is the best guide for selecting food for this affection; one thing we have often noticed, if a person expects that an article will prove

hurtful, it is much more likely to do so; and helps to explain why the individual who is always watching the effects of different foods upon himself, sooner or later suffers from indigestion. In most cases, animal food is best digested, especially old and tender meats, plainly but well cooked. Pastry, rich puddings and sweetmeats are to be eaten sparingly, or discarded; ripe fruits in moderation, are useful. A very good rule for dyspeptics to follow is, *aim to eat like persons in health and give the matter no further thought.* Regularity in meals is an important point. More than three meals a day is sometimes advisable, and the amount of food taken should be regulated by the judgment, rather than the appetite. The latter is not to be relied upon in dyspepsia, as it is sometimes craving, thus leading the patient to over-indulgence or it may be the opposite, and not sufficient nourishment is taken to supply the demands of the system. Of the two errors it is better to eat too much than not enough. A moderate quantity of liquid only should be taken at meals. A cup of hot water, either with or without "the trimmings," is perhaps the best. A few grains of capsicum added to the boiling water makes it acceptable to many individuals who object to the plain water. Alcoholic drinks are positively injurious; the degree of harm is in proportion to the per cent. of alcohol they contain. (See article on Alcohol, Part I.) Exercise should be taken in the open air, but if taken simply as exercise, will do very little good. It should be combined with some occupation that tends to keep the mind of the patient from his or her disorder. Change of occupation is often advisable. Traveling, especially when the mind is diverted with a succession of novel scenes, is highly useful. Nothing in the line of medicine will be of so great benefit to the dyspeptic as agreeable company during and after meals.

DIARRHŒA.

The term diarrhœa is used to denote unnatural frequency of the movements of the bowels. It occurs as a symptom of certain structural lesions, such as those incident to tuberculosis of the intestines, and the ulceration of typhoid fever. Occurring independent of such conditions, it is a functional disease, and may be either acute or chronic.

As an acute affection it affects persons of both sexes and all ages, occurs at all seasons of the year, but most frequently in warm weather. This is probably due to the large proportion of fruit and vegetables in the food during this season, and to the effects of heat in weakening digestion.

Causes. - Diarrhœa, when functional, is mainly due to defective digestion and over-indulgence at the table. Many individuals are sure to suffer from diarrhœa after eating certain articles of diet, which others partake of with impunity. Strong mental emotions may give rise to diarrhœa, many persons being attacked during a wind or thunderstorm. Instances have been recorded when the receipt of bad news has precipitated an attack of this affection. The effects of fright in producing sudden attacks of this disease are well known.

Treatment.—If diarrhœa is due to errors of digestion, the remedies prescribed under dyspepsia should be used; if from over-eating, a mild cathartic, such as rhubarb, a seidlitz powder, or epsom salts, should be given in sufficient quantities to act mildly upon the bowels. The first named is probably best adapted to most cases, and may be given in powder, tincture or fluid extract. The action of this drug can be told by the evacuations becoming more yellow. After the bowels have been acted upon, a dose or two of cholera mixture (see prescriptions, Vol. III) may be all that is required. If the diarrhœa continues, and

there is any pain, No. 50 should be taken in teaspoonful doses every two, four or six hours.

No. 50.

℞

Tinct. Opii deodorata	fl. ʒ ss.
" *Rhei*	" ʒ ss.
" *Catechu comp.* (*U. S. P.*)...	" ʒ j.
Oleum Sassafras	gtts. xx.
Tinct. Lavandulae comp. q. s. ad...	fl. ʒ iv.

M.–Sig :—ʒ j every two, four, or six hours as required.—"*Dr. Lomis.*"

Diarrhœa is often unyielding to astringent remedies. In this instance we advise the giving of quinine in two grain doses for a week or ten days. When the movements emit an offensive odor the following is of great benefit :

No. 51.

℞

Tinct. Rhei ..... }	aa. fl. ʒ iv.
" *Opii deodorata* ..... }	
Bismuthi subcarb.	ʒ iv.
Acid Carbolic (*pura*)	ʒ ss.
Tinct. Lavendulae	fl. ʒ j.
Syrup Simp. q. s. ad.	" ʒ iv.

M.–Sig.:—Shake thoroughly, and give ʒ j every two, four or six hours, as required.

In administering medicine for diarrhœa it should be borne in mind not to check too rapidly. A good plan is to give a couple of doses every two hours, then wait. If the bowels do not move at the end of two hours, the remedies can be withheld till they do, and then give as required.

In this disease, when the pain is at or near the umbilicus, and quite constant, five drops of tincture nux vomica to a teacup of water, and of this a teaspoonful to be given every fifteen minutes, often gives excellent results. It should be continued for a couple of days. In chronic diarrhœa nothing will be found better than

No. 52.

℞

Bismuthi subcarb. ..... ʒ iv.
Morphia Sulph. ..... gr. j.

M.-et div. in pulv. No. xvj. Sig.:—Take one powder night and morning.

The diet must be carefully regulated. Care should be taken that the water drank is pure. Iced drinks must be taken with extreme caution. Daily sponging of the body with cold water during extreme heat will act as a preventive of diarrhœa. This remark is especially applicable to children, and to those of enfeebled constitution. Diarrhœa dependent upon structural lesion will be treated under the diseases in which it occurs.

DYSENTERY.

By dysentery is meant an inflammation of the large intestines, attended with mucus and bloody dejections. There are two forms of this disease, sporadic and epidemic.

Sporadic dysentery generally begins with ordinary diarrhœa; that is, the evacuations are more or less composed of fæcal matter. Dysentery may properly be said to be present when the dejections are composed of mucus and water, streaked with blood. The amount passed at each act of defecation is generally small, but the act is frequently repeated, slight evacuation often taking place every hour or two, and sometimes after intervals of a few moments only. The evacuations are usually preceded by griping or colic pains. There is generally more or less desire to strain—*tenesmus*. These are the chief sources of suffering. The pulse, as a rule, is not much changed, and only in exceptional cases is there fever. The tongue may be coated or remain natural. Thirst is a prominent symptom. The duration of the disease is from four to twenty days.

Causes.—Climate seems to have a close relation to

the cause of this affection, as it is vastly more frequent in tropical than in cold or temperate climates. The disease sometimes occurs in cold weather, and is doubtless then due to impurities in the drinking water.

Treatment.—Unless the bowels have been well relieved, the first thing is to administer sufficient *castor oil*, *epsom* or *rochelle salts*, to produce a free movement, whichever can be best taken by the patient. This should be followed by an enema of starch, into which has been stirred thirty drops *tincture opium* (laudanum). If for any reason this cannot be administered, use No. 53, introducing a suppository well up into the rectum, and repeat every four to six hours as required, to control the pain and evacuations.

No. 53.

℞

Morphiae Sulph.	grs. vj.
Cosmoline.	" lxiv.
White Wax.	" xx.
Oleum Theobromae	" xc.

M.–et ft. suppos. No. xij. Sig.:—Use as directed.

If these are not retained, the following, pill, No. 54, should be taken every four hours, until relief is obtained.

No. 54.

℞

Pulv. Opii	grs. xx.
" *Resinae*	" xxx
" *Acaciae*	" xx.

Aqua q. s.

M.–et div. in pilulae xxv. Sig.:—One pill every four hours until relieved.

The diet should be restricted to milk and beef soup, prepared from "*Mosquera's Beef Meal.*" Small pieces of ice can be swallowed or held in the mouth to allay thirst. If there is prostration, heat should be applied to the extremities, and stimulants given in the form of hot milk. This disease rarely proves fatal.

EPIDEMIC DYSENTERY.

Epidemic dysentery does not differ essentially from sporadic, excepting that it occurs in epidemic form, and is more liable to be attended with bloody evacuations; hence the term *bloody flux*, which is sometimes applied to it.

Different epidemics vary greatly as regards gravity. In sporadic dysentery, the inflammation and ulceration are confined mainly to the rectum. In the epidemic form, it often extends over a larger portion of the large intestine; the ulceration is deeper, hence the greater amount of blood. Dejections containing blood denote gravity of the disease. Cases, however, are recorded as terminating fatally in which this symptom was entirely wanting. In severe cases there is great prostration, indicated by the pulse becoming weak and frequent, the extremities cold.

Causes.—The cause of epidemic dysentery is not as yet definitely known. It is without doubt, external to the body. The disease is not contagious, and the successive occurrence of cases among members of one family or community, is accounted for by the fact that the persons attacked, are alike exposed to the special cause; and it is from such source the disease is contracted rather than from each other.

Treatment.—In mild cases the treatment given under sporadic dysentery, will be sufficient. If there is much blood in the evacuations, attended with coldness of the surface, the patient must be put to bed and external warmth applied in the form of hot irons, bottles of hot water, etc. A tablespoonful of brandy with water or milk should be given, and repeated every hour or two. If brandy is not at hand, give whisky; only the purest of either should be given. The toleration of alcoholic stimulants in this disease is frequ ntly wonderful, patients taking without excitation of the circulation, quantities which in health would produce profound intoxication. The same is true in reference to the toleration of opium

preparations. The suppositories No. 53, are an excellent remedy in epidemic dysentery, and may be used every two to four hours, to arrest the movements and allay pain. Should these not be retained, procure the following No. 55, and give a teaspoonful every two hours until four doses have been taken. Then give at longer intervals as may be required to relieve the pain and control the movements.

No. 55.

℞

Morphiae Sulph.	grs. ij.
Tinct. Rhei.	fl. ʒ j.
Aqua Cinnamomi q. s. ad.	" ʒ ij.

M.–Sig:—ʒ j every two hours until four doses are given, then at longer intervals as directed.

Quinine should be given in two grain doses four times a day, from the beginning of the disease till convalescence is established. From what has already been written, it will be understood that the object in treatment is to arrest the discharge of blood and serous fluid, and the reader must be guided by the indications. If the patient is going to stool every ten to fifteen minutes, as is sometimes the case, No. 55 could be given every thirty minutes till four doses have been taken; or if two doses accomplish the object, stop there and then give as required; on the other hand, if the movements are two to four hours apart, a very good plan is to give after each evacuation. Diet must be strengthening, and nothing is better than pure milk, and next Mosquera's beef meal, broth and tea.

We wish again to call attention to the necessity of keeping the patient warm—mustard plasters to the feet and calves of the legs, and left on just long enough to cause redness—is effective for this. If the blood is kept at the surface, the hemorrhage from the bowels will be easier controlled. Cold water and ice can be given *ad libitum*. If the patient *craves* any special article of diet, give it in moderation; we do not mean by this a moderate wish

or desire, but an *actual* craving. Epidemic dysentery without complications will not prove fatal often if properly treated, and treatment is commenced in time.

CONSTIPATION.

Constipation denotes an inactive state of the bowels, the evacuations being deficient in number. *Costiveness* is often used in the same sense, but properly means an insufficiency in quantity, the number of dejections being normal. This is not a serious disease of itself, but is *very* important as leading to other ailments. The frequency of the evacuations will vary with the age and mode of living; children at the breast evacuate the bowels several times a day, adults once, and old people and those of sedentary habits, move rarely; some persons have habitually two or three evacuations daily, and on the other hand, some have an evacuation regularly every second or third day without any of the inconveniences of constipation. Experience, however, shows that one free evacuation from the bowels, is the rule of health.

Constipation gives rise to various morbid effects, such as feeling of weight and pressure in the rectum, abdominal distension, flatulence and colic pains. Piles are often attributed to this affection. It also gives rise to pain in the head, dullness of the mind, flushing of the face, palpitation, and general ill feeling. From the violent straining efforts required in constipation, hemorrhage into the brain and rupture (hernia) have resulted.

Causes.—Weakness of the muscular coat of the large intestines or the abdominal muscles, may give rise to this disorder. Habit probably has more to do with this condition than any other one cause. Children and many adults consider the act of defecation an annoyance to be escaped, and the desire is resisted, or the mind being preoccupied, the call is unheeded, and the act is postponed until at length the sensibility no longer gives notice of

fecal accumulation. The result of this unheeding of nature is, the accumulation goes on, till the rectum and other portions of the large intestines become distended and paralysis follows. Deficiency of bile in some cases is no doubt a cause. The eating of food which leaves no residue contributes to constipation, as do any and all circumstances that tend to lessen the fluids of the body, as abundant perspiration or diuresis.

Treatment.—From what has been written as to the cause of this disease, the treatment seems clearly indicated. Children should be taught early in life to attend regularly and promptly to the desire to evacuate the bowels. The habit will in a short time become fixed, and will be the means of preventing much indisposition. If constipation exists, it is advisable to commence with the simplest remedies. A glass of pure water taken before breakfast is often sufficient. This may be taken either cold or hot, as the patient prefers. Graham or brown bread once or twice a day, will relieve many cases; a baked apple with brown sugar for breakfast is excellent; the eating of a fig with each meal, or a few prunes or other fruit, will benefit many cases, and not a few will be entirely cured. More obstinate cases will require more active remedies. No. 56 taken in dessertspoonful doses, night and morning, will be found very effective as well as an elegant preparation, readily taken by children and others who find ordinary remedies nauseating.

No. 56.

℞

Cascara Cordial (*P. D. & Co.*). . fl. ʒ xij.

Sig.:--Take as directed.

If taking the above once a day will produce a free evacuation, this is all that is required; on the other hand, if necessary, take three times a day. The following pill, originating with the late Dr. Palmer of Michigan University, has proven very efficacious:

No. 57.

℞

Pulv. Ex. Aloe. Soc. (*P. L. & Co.*)	}	aa. 3 j.		
" " *Hyoscyami,* " "				
" " *Ipecac,* " "	}	aa. grs. xij.		
" " *Nucis Vomicae,* " "				

M.–et ft. pilulae No. cxx. Sig.—Dose, one to three pills at bedtime.

It is best to commence these pills, one at bed-time and if it does not prove sufficient, take next night two. If two do not succeed in producing the desired effect, increase the dose to three, or even four. After the required dose is determined, continue for a week or ten days, then leave off one pill, and after another like period, again lessen the dose. If one pill, or even a half, succeeds in causing an evacuation the following morning, it is all that is required. The use of a syringe to produce an evacuation in constipation, is not advisable, and should be resorted to only in extreme cases, and discontinued as soon as the bowel is toned up by the above remedies. Medicines to purge the bowels should not be used, as they only tend to weaken, instead of strengthening the already distended and partly paralyzed bowel.

The most important part of the treatment of constipation, is the adoption of a rule to solicit an evacuation at the same hour daily. The time of day most convenient should be selected, and reasonable time devoted to this function. This should be considered in the light of a duty, not to be omitted a single day except from most urgent causes. While endeavoring to establish a certain hour for this function, do not neglect or postpone the call to defecate, when it occurs, either after or before the time for the habitual performance of the act. If this plan were early taught and carried out in health, habitual constipation would be as rare as it is now frequent. This applies with greater force to the training of girls, most of whom become affected by the disease and suffer from it

all their lives. The old Scotch physician's advice is extremely applicable as a closing remark to this very important subject: "Keep your mind easy and your booels open, and ye're sure to do weel."

INTESTINAL COLIC.

Colic really means a painful spasmodic affection of the colon, but it is used to signify any pain occurring in paroxysms, and of a griping character. To make the term more definite, the anatomical part affected is usually named in connection, thus hepatic colic, nephritic colic and intestinal colic.

Causes.—Intestinal colic is generally due to the local action of articles of diet, and may result from excess in quantity, or the indigestible quality of the food. An attack of colic is produced in some persons by certain articles of diet, in consequence of an idiosyncrasy which is inexplicable. In these cases it does not seem to matter how little of the article is eaten, the colic is sure to follow; notably amongst these articles are honey and shell fish.

Symptoms.—Intestinal colic is characterized by paroxyms of pain, usually in the region of the umbilicus. This varies much in severity in different cases. The patient bends forward, draws the knees upward and twists about in various directions, often crying and groaning aloud. This continues for a few moments and then either ceases or is very much abated, to return again in a short time. An attack lasting for a short time and ending in one or more free evacuations from the bowels, is so common as to be familiar to every one.

Treatment.—In mild attacks, some aromatic stimulant is quite sufficient, such as mint, anise, ginger, etc. Chloroform may be given in ten to fifteen drop doses, and repeated every fifteen to twenty minutes till three or four doses are given. A dose or two of the cholera

mixture, given under domestic prescriptions will relieve most cases. Warm applications should be made to the abdomen and extremities. If these remedies do not relieve, give No. 58 every half hour, till the four are taken.

No. 58.

℞

Morphiæ Sulph.	gr. j.
Pulv. Pepsinum purum (P. D. & Co.)	grs. iv.
Bismuthi Subnit.	" xij.

M.-et div. in pulv. No. iv. Sig.:—One powder every half hour to relieve pain.

In many instances one powder of the above will suffice. We advise, however, trying the other remedies first. If the bowels do not move in twelve hours after the pain ceases, give sufficient epsom salts to produce a free evacuation. The diet should be light for a few days following the attack. *Intestinal colic*, although an extremely painful disease, rarely if ever proves fatal.

HEPATIC COLIC

Is caused by the passing of a gall-stone through the duct leading from the gall-bladder to the intestines.

Gall-stones (biliary calculi) form in the gall-bladder from the constituents of the bile, being mainly composed of cholesterine and the salts of lime. They vary much in size and also in the number contained in the gall-bladder; as high as two thousand have been found after death, and two or three hundred are not uncommon. They are not present in all individuals, and generally their existence is not suspected until they occasion, by their passage toward the intestines, paroxysms of hepatic colic. The time occupied in passage of a gall-stone, and the suffering, will depend on its size and irregularity of shape.

Symptoms.—The pain in this disease is *suddenly* developed and is *continuous*, that is, it is not attended with

intervals of rest. In other words, the pain continues from the time the calculi enters the duct till it leaves it. The attack is often violent, causing the patient to writhe and try different positions, hoping thereby to obtain relief. Vomiting occurs in nearly all cases, and is repeated more or less frequently. The pulse is weak, but not increased in frequency; the face is pallid, denoting great suffering; chilly sensations sometimes occur. After a variable time, depending, of course, on the period occupied by the passage of the stone into the intestine, the pain as suddenly ceases as it began. If the attack continues for any length of time, the urine will be dark in color from the presence of bile.

Treatment.—From the symptoms it will be understood that it cannot be expected to entirely relieve the pain of hepatic colic, consequently the remedies must be with a view to ameliorating it. For this twenty-drop doses of *tincture opii* (laudanum) may be given every half hour until three or four doses are administered. If convenient to a physician, we advise that he be called in, as he will be able to relieve the patient more quickly by injecting morphine hypodermically. Warm fomentations should be applied to the seat of pain. For the vomiting equal parts of limewater and milk may be given. For the remedies to prevent the further formation of gall-stones, the family physician should be consulted. Nephritic colic will be treated under diseases of the urinary organs.

CHOLERA MORBUS. (*Sporadic Cholera.*)

This is a functional disease of the stomach and intestines, commencing with vomiting, which is speedily followed by purging. These two symptoms, occurring in quick succession, and recurring either simultaneously or in close alternation, constitute the prominent distinctive symptomatic features of this affection. The evacuations from the bowels and stomach are generally abundant at

first, and largely composed of alimentary and fæcal matters; afterward liquid is vomited which is acrid, causing a scalding sensation in the throat. In like manner the dejections become liquid, giving rise to a burning sensation at the anus. The acts of purging are preceded and accompanied by colic pains, which are temporarily relieved by a free movement of the bowels. There is usually dryness of the throat and intense thirst; the pulse is more or less accelerated and feeble; temperature is changed; skin is cool, and frequently bathed in clammy sweat. The symptoms may continue for several hours and then gradually diminish, leaving the patient much weakened, but from which a rapid recovery follows.

Causes.—Sporadic cholera, in the majority of cases, is due to indigestion resulting from the use of improperly cooked food, under or over-ripe fruit, etc. In many cases the cause is not easily determined.

Treatment.—Take every half hour a teaspoonful dose of the cholera mixture before referred to. (Prescription in Vol. III.) This is an affection in which the hypodermic administration of medicine is highly beneficial, as there is no possibility of its being vomited, and further, its prompt action prevents much suffering. The patient *must not be allowed to drink*, as it only helps to prolong the attack. To relieve the thirst small pieces of ice may be held in the mouth.

Limewater and milk in equal proportions may be given in tablespoonful doses to allay the thirst. If there is much prostration whisky or brandy may be combined with the last two articles in the proportions of a teaspoonful of the stimulant to a tablespoonful of the other two. As before stated, this disease rarely proves fatal.

LEAD COLIC.

Painter's colic, plumber's colic, Devonshire colic, dry bellyache, are names which have been applied to this disease at different times and places.

Symptoms.—As in other forms of colic, pain is the prominent symptom. In this complaint it is at first comparatively slight, but gradually increases until it becomes intense. The pain is non-spasmodic, and generally located at or near the umbilicus, shooting into the back, genital organs and in other directions. The bowels are constipated; the exception to this rule is rare. The urine is scanty. The pulse is slower than in health, and irregular. There is pallor of the countenance, and a peculiar blue or slate discoloration of the gums at their junction with the teeth, which is distinctively characteristic of this disease. "Wrist drop" may not always be present.

Causes.—The disease is due to the introduction of lead into the system in sufficient quantities to give rise to its morbid effect, to which is applied the term "plumbism." The modes in which lead may be introduced into the system are numerous; it may take place through the lungs, stomach, mucous membrane or skin.

Painters, plumbers and compositors, are subject to this complaint. Drinking of liquids of any kind which have been stored in receptacles lined with lead, or even drawn through lead pipes or faucets, are prolific sources of the disease. Hair dyes and cosmetics are another source.

Treatment.—To relieve the pain apply to the abdomen a thin woolen cloth, seven to eight inches square, saturated with No. 59, and cover over entirely with oiled paper, and outside of this a couple of thicknesses of cotton cloth and hold all in place by a bandage pinned at the back.

No. 59.

℞

Tr. Aconiti . . . . . (Made from P. D. & Co.'s normal liquid.)
Chloroform . . . . . } aa. fl. ʒ j.
Glycerina . . . . . }

M.–Sig.:—Apply externally as directed. Shake well before using.

A warm bath is also very efficacious in relieving the pain of this disease, and also is advantageous in removing

the poison from the system. As an internal remedy for the elimination of the lead, nothing will be found better than the following, which was first used by Dr. Melsens, an eminent French physician.

No. 60.

℞

Potass. Iodidi	ʒ ijss.
Tinct. Gentianae comp. }	aa. fl. ʒ ss.
" *Cardam. comp.* }	
Aqua q. s. ad	fl. ʒ iv.

M.-Sig.:—ʒj three times a day after meals.

After taking the prescription for a week at the above dose, gradually increase till two teaspoonfuls are taken, and continue for three or four weeks. While taking the above No. 60, it is advisable to use sufficient epsom or Rochelle salts twice a week to produce a free evacuation —best taken early in the morning.

PERITONITIS.

The peritoneum is a serous membrane lining the abdominal cavity, and inclosing the intestines. Inflammation of this membrane constitutes the disease under consideration, and is commonly - though incorrectly - spoken of as *inflammation of the bowels.* Peritonitis may be either *acute* or *chronic.* If limited to a small portion of the membrane, it is then called *circumscribed* or partial peritonitis.

Symptoms.—Acute general peritonitis is usually developed rapidly. The pain, which somewhat resembles that of colic, commences at a particular point and extends over the entire abdomen. A deep inspiration, sneezing and coughing, increases the pain. If pressure be made over the abdomen, especially at the point where the pain commenced, the suffering is greatly increased; this symptom is nearly always present. The patient usually

lies with the knees drawn up in order to lessen the tension of the abdominal muscles. The abdomen is distended and tense to a great degree; constipation generally exists, but there are exceptions to the rule; vomiting is present in a large majority of cases; *thirst is a prominent symptom;* the tongue is coated and dry, the dryness increasing as the disease progresses; the pulse is frequent, numbering 120 to 130; below the first number would be considered favorable. Temperature varies from 101 degrees to 104 degrees, the last named denoting gravity. The countenance is haggard and anxious.

Causes.—Peritonitis seldom occurs except as a complication to other affections. Perforation of the intestines is the most frequent cause. This accident occasionally happens in the course of typhoid fever and in tuberculosis, attended with ulceration of the intestines. Peritonitis is frequently caused by getting articles such as cherry pits, seeds, etc., into the *vermiform appendix.* Inflammation results from this accident which rapidly spreads to the peritoneum. Several examples of this kind have fallen under the writer's observation.

Treatment.—If a physician can be called, do not attempt to treat the disease without assistance. If for any reason one cannot be secured, give the following (No. 61) in teaspoonful doses every two hours.

No. 61.

℞

Oleum Terebinth	fl. ʒ j.
Fluid Opium (*P. D. & Co.*)	" ʒ vj. .
Mucil. Acac.	" ʒ iv.

M.–Sig.:—ʒ j every two hours.

A poultice of linseed meal, large enough to cover the whole abdomen, should be applied as hot as the patient can bear it, and changed every hour. *No attempt should be made to produce evacuation of the bowels.* If they do not

move for a week or ten days, no anxiety need be felt. The diet should be nourishing and of such nature as to be principally absorbed by the stomach. Beef tea made from Mosquera's Beef Meal and Beef Cocoa, will meet this indication most admirably.

Uncomplicated, the prospect of recovery is good; if arrising from perforation or resulting from sphacelation, due to an irritating body in the vermiform appendix, the chances for recovery are small. The average duration of fatal cases is about six days. Convalescence is slow, and great care is necessary during this period to prevent the patient from eating any food which will in any way cause a relapse. The diet during convalescence should be largely in a liquid form, milk, milk and eggs, beef tea, soups, etc.

DROPSY OF THE PERITONEUM.

(*Hydro-Peritoneum.*)

An accumulation of watery fluid within the peritoneal cavity is known as hydro-peritoneum. The term acites is applied to denote the same condition.

Dropsy properly is only a symptom or effect of disease. In the large majority of instances, when it occurs in this locality it proceeds from a diseased condition seated in the liver.

Symptoms.—Enlargement of the abdomen is usually the first symptom that attracts attention. In about half of the cases swelling of the feet and ankles occur previous to the appearance of the dropsy of the abdomen. There is great emaciation and pallor, the former condition being extremely noticeable in the upper part of the body. There is no fever. The pulse is increased in frequency, and feeble. The urine is scanty and generally darker in color.

Treatment.—Should be with a view to removing the effused liquids. This can be better done by the skin and

bowels than by the kidneys. Hot air or water baths may be given two or three times a week, depending upon the strength of the patient. To act upon the bowels give:

No. 62.

℞

Pulv. Zingiberis	grs.	XXX
" *Jalapae*	"	XL.
Potassa Bitartras	"	LXXX.

M.-et div. in pulv. No. 4. Sig.:—One powder every other night.

Liquids of all kinds should be restricted. A physician should be consulted for remedies to relieve the diseased condition upon which the dropsy depends. Permanent recovery from this affection is the exception rather than the rule.

ENLARGEMENT OF THE SPLEEN.

This condition is commonly known as *ague cake*, probably from the fact that enlargement of this organ occurs most frequently in connection with ague and intermittent fever.

Symptoms.—This disease is attended with very little or no pain or tenderness on pressure. If the enlargement is great a sense of weight is felt in the region of the spleen. Occasionally it can be noticed from the distension of the side.

Treatment.—The cause and resulting consequence of this affection are so little understood that the treatment must be in reference to each individual case. This must be left to the medical attendant No very serious results need be anticipated from this complaint, as it is well known that the spleen can be removed from inferior animals without the destruction of life, or any serious injury to health. There is reason to believe that the same might be done to man. To deny to this organ any functions, however, is to credit ourselves with knowledge superior to Him who made man after His own image.

SEA SICKNESS.

With a very little caution sea sickness can be escaped, provided the individual possesses a moderate degree of good health. Many people go aboard ship expecting to be sick, and they are seldom disappointed. The real trouble in this disease is in the brain and spinal column, and not in the stomach; and if the nausea is escaped until the nerve centers become accustomed to the motion of the boat, there is very little danger of its occurrence. The second night previous to starting on your voyage take one compound cathartic pill, and sufficient epsom salts the following morning to secure a free evacuation. The diet should be light from this time until after starting. Make up your mind to be well, and as soon as under way take five grains of bromide of sodium in a wineglassful of water, and renew the dose whenever you feel the slightest symptoms of nausea. Some effervescent salts should be taken every morning before breakfast. Keep on deck as much as possible; dress too warmly rather than the opposite, and walk the deck at least one hour daily, rain or shine; avoid over-eating; endeavor to have your meals regularly, and aim to cheer your fellow passengers. By this you will forget yourself, which is the most valued prescription we know of for the prevention or cure of sea sickness.

LIVER DISEASE.

The liver is *facile princeps* among the organs of the body, both as regards its size and the importance of its functions. That it is subject to numerous diseases, both organic and functional, is a well established fact. That it is greatly maligned is not less easily proven. Unqualified practitioners are in the habit of making this organ the "scapegoat" for their ignorance. When an indisposition is not understood by them it is "the liver"; if rem-

edies prove inactive, "the liver" is blamed; if the cause of a pain or ache cannot be discovered, it is again "the liver." This constant and indiscriminate charging the liver with causing innumerable disorders, has led the masses to look upon this organ as a useless part of their anatomy, which they would be better rid of. By falsely educating people as to the cause of their complaints, has created a market for "liver invigorators" and "patent cholagogues" unrivaled only by the supply. The Almighty makes no mistakes, and in creating the liver, the principal organ of the body, it was not intended it should be constantly at variance with the system as regards the laws of health. Neither is it. The diseases known to actually affect this organ are quite sufficient without adding any supposed or imaginary disorders.

HOB-NAILED OR GIN LIVER. (*Cirrhosis of the Liver.*)

This is a condition of the liver characterized by the organ presenting a yellowish-orange color, somewhat reduced in size,—the left lobe sometimes entirely gone, the surface as a rule being covered with little projections.

This condition is incurable. It gives rise to *hydroperitoneum*, and is caused by the habitual use of alcoholic stimulants for a long period. The disease rarely occurs before the age of thirty, in the majority of cases the age exceeds fifty years.

JAUNDICE. (*Icterus.*)

This term denotes the presence of bile in the system in sufficient quantity to give to the conjunctiva and to the skin a more or less yellowish color. Jaundice is not a disease of itself, but merely a symptom, and generally points to some liver affection. It occurs also in remittent and relapsing fever. As has been shown in Part I the bile passes to the intestines by the "biliary duct," where

it acts in a beneficial manner in the process of digestion. If through any means this flow is impaired, the bile is re-absorbed and taken up by the blood and carried through the whole system, giving rise to the jaundiced appearance. A very moderate absorption of the bile may take place, and will be treated under *functional liver* trouble. If this condition is at all marked a physician should be consulted.

FUNCTIONAL AFFECTIONS OF THE LIVER.

These might with propriety be included with the diseases relating to stomach disorders, so closely are they connected with each other by cause and effect.

In addition to the secretion of bile and formation of liver sugar (glycogen), the liver has another important function, viz., taking from the blood as it circulates through this organ deleterious substances contained therein, and destroying them. During this destructive process (which is chemical) animal heat is produced, and if the amount of material to be burned (destroyed) is not in excess, there is no unusual result noticed, the act being purely physiological. If on the other hand the quantity of food taken prove excessive, or the quality be such that it is not digested and assimilated, then too great an amount of materials is sent to the liver for destruction, and the outcome is a liver "disturbance." The attack is the "surfeit" of the older medical writers; in other words, the individual eats more than is good for him or her. This condition occurs more frequently in childhood than in adult age; the latter profit by experience and avoid the causes of this disturbance. Would it not be wise to extend the knowledge thus learned to the inexperienced by teaching them not to follow the palate regardless of the wants of the body? These attacks in children are accompanied by high fever, to the great discomfort of

the child, the dismay of its parents, and the benefit of the family doctor. Not infrequently a child is out with the nurse or mother for an afternoon, or perhaps to a child's party, and eats too much of the "good things" in which all little ones delight, and the night following is restless, perhaps wakeful. The ever watchful mother visits the little one to find it "just burning up with fever," and the first thing thought of is that some contagious disease has been contracted, and the doctor is sent for at once. The doctor arrives, and is informed that "Jennie" or "Willie," as it may be, was out the day previous where there were other children, and fears are entertained that she or he has taken "scarlatina," diphtheria, or something of the kind. The doctor feels the pulse, looks wise, writes a prescription, assures the parents that there is *no* danger, informs them that he will call again the following day, and hopes to find the patient better. By the next day the liver has burned up the extra amount of refuse and is ready to resume the "even tenor" of its way. Doctors are human, and it can hardly be expected that they will destroy so good an opportunity for increasing their reputation (which is stock in trade) by explaining the cause of this seemingly severe attack. They should not, however, make the case worse than it really is. The writer has known several instances where the physician (?) called to attend similar attacks as the one described above, pronounced typhoid fever, scarlatina or diphtheria, as suited his purpose best, and then claimed it was his great skill that "broke up" the disease. Hanging is too good for such charlatans. If it be remembered that all contagious diseases have a stage of *incubation*, the shortest being forty-eight hours, the fear that the child under the circumstances described has any contagious disease, will be avoided. Instead of sending for the doctor in this attack we advise that a teaspoonful of *tincture of rhubarb* in the same amount of sweetened peppermint water be

given the child, and then use prescription No. 41. To another similar amount of water add 10 grains *bromide of potassa*, and give teaspoonful doses of each, every fifteen minutes alternating. This brings each remedy every half hour. If the child vomits or the bowels act freely, the symptoms will likely abate in a few hours. If the head is at all warm, apply cloths wrung from cold water. Care should be exercised that the child does not again partake of the article which gave rise to the indisposition, at least in quantities to injure. In older persons this *liver disturbance* is slower, and is spoken of as "torpid liver." There is headache, a foul tongue, with a bitter taste in the mouth, and a loss of all appetite; the latter, by leading to the rejection of all food, permits the system recovering itself; the surplus material is burned up, forming into urea, and thus the system clears itself by starvation. It is nature's plan of striking a balance sheet, and as such should be respected. Just the opposite of torpidity may occur, and in such instances is not referred to the livver. In either case there is more or less disturbance of the alimentary tract, either a constipation or diarrhœa. A restricted diet for a few days is usually all that is required. Persons liable to liver disturbances should exercise care in eating lean meats, especially dark meats, eggs, rich cake and pastry; alcoholic beverages of all kinds should be eschewed. If it is thought necessary to stimulate the liver, the following, No. 63—recommended by Dr. Fothergill of London, England,—will be found very efficacious.

No. 63.

℞

Sodii Sulphas ..... ʒ j.
Aqua q. s. to dissolve.
Acid. Sulph. arom ..... gtts. xj.

M.-Sig.:—Take one-half upon retiring, and balance in the morning, if required, to cause a free evacuation.

For chronic torpidity of the liver, indicated by a general dull feeling, more or less headache, loss of appetite and yellowish coating on the tongue, take No. 64, teaspoonful three times a day before eating.

No. 64.

℞

Acid. Nitro. Hydrochlor. dil. ..... ʒ vj.
Aqua pura q. s. ad. ..... fl. ℥ iv.

M.–Sig.:—ʒ j three times a day before meals.

If the bowels should be constipated, take No. 63, teaspoonful doses night and morning.

CHAPTER IX.

DISEASES OF THE RESPIRATORY ORGANS.

COLD IN THE HEAD. (*Coryza, nasal catarrh.*)

The predisposition to cold in the head varies greatly in different individuals. Feeble, delicate adults and children are more liable to attacks than individuals who are robust.

Symptoms.—The symptoms of acute nasal catarrh are pretty generally known, as most individuals have had personal experience of them, therefore they need but brief notice here. The first thing the patient notices is a feeling of dryness, and of more or less obstruction in one or both nostrils; there is a prickly sensation within the nostrils, which is followed by sneezing. The dryness is soon followed by a discharge from the nostrils of a watery liquid, nearly colorless, of a saltish taste. The sense of smell and taste are perverted, the tone of the voice is nasal. In about half the cases there is pain in the forehead, sometimes the air passages are implicated, then there is hoarseness. If the disease extends to the Eustachian tubes, pain or a roaring in the ears is induced, and occasionally temporary hardness of hearing.

These local symptoms are generally accompanied by more or less febrile symptoms. On the second or third day the secretion becomes less profuse and grows thicker, and of a yellowish color. The disease terminates in recovery on the fifth to the eighth day.

Causes.—*Nasal catarrh* is usually attributed to "taking cold." This is not true, though most cases depend upon exposure to cold, and particularly exposures of the feet. Local irritants enter largely into the causes of this disease. The most common of these are hot air, dust, acrid gases, snuffing tobacco by those unaccustomed to it. Coryza is a symptom also of other diseases and will receive attention as such in its proper place. This disease is not contagious, but at times is epidemic.

Treatment.—Various methods for "breaking up" a cold have been recommended, but none of them are infallible. A thorough perspiration is perhaps the surest, but is objectionable unless proper precaution is taken to prevent an addition to the already existing complaint. We advise as treatment adapted to most cases, the following: At first symptoms of coryza, take five grains quinine, and upon going to bed take a *hot* foot bath, following with No. 65 at one dose, after getting into bed.

No. 65.

℞

Tr. Opii	gtts. xv.
Vin. Ipecac	" xxx.
Tr. Capsici	" v.
Aqua q. s. ad	fl. ʒ j.

M.–Sig.:—Take at one dose as directed

The following morning a sponge bath with tepid water should be given, followed by a brisk rubbing with a coarse towel or flesh brush. The second night upon retiring, take one compound cathartic pill and repeat in the morning if necessary; quinine should be taken for a couple of days after this—two grains four times a day. The patient should remain indoors for a couple of days. Care should be exercised to get rid of acute nasal catarrh as quickly as possible, or it may become chronic.

Chronic catarrh is a very obstinate disease; it is this

form that is meant usually when "catarrh" is spoken or written of. In chronic catarrh, the lining membrane of the nasal passages becomes thickened from the existing inflammation, and causes a permanent narrowing of them. In this way the secretion is retained for a varying period within these passages, and becomes more or less decomposed. This gives rise to fetid odor of the breath of individuals suffering from this affection. The secretion which is expelled by blowing the nose, or drawn into the throat and then hawked up, varies in quantity and appearance; sometimes it is like pus; it may be semi-liquid or in crusts.

Treatment.— The treatment of catarrh is very unsatisfactory with most practitioners, consequently large amounts of "patent cures" are taken by those who are so unfortunate as to be afflicted with this disease.

If it be remembered that this is a *chronic* affection - and consequently cure is necessarily slow—it will be easier to *persist* in the treatment until beneficial results follow. No one should expect to be cured of chronic catarrh in less than four to six months' continuous treatment. The general health should be looked after; if there seems to be any scrofulous condition or ulceration, No. 66 should be taken three times a day—teaspoonful doses.

No. 66.

℞

Calcium Iodidi..... grs. xvj.
Syrup Trifolium comp. (*P. D. & Co.*) fl. ʒ viij.

M.-Sig.:—ʒ j three times a day.

As a local application, use night and morning No. 67, first cleansing the nasal passages by using warm water; sage tea, made by steeping one ounce of best sage leaves in one-half gallon of soft water, straining—or better, filter through paper—this can be used with the nasal douche.

An effort should be made to get the remedy not only

into the front of the nose, but the posterior portion as well. If a small quantity should be swallowed, no harm will result. In addition to the remedies, hygienic measures in reference to air, sunlight, exercise, diet and bathing must not be neglected.

No. 67.

℞

Sodii Bicarb ..... } *Sodii Borat* ..... }	aa. ʒ ij.
Ac. Carbolic (*pura*)	ʒ ss.
Glycerina	fl. ℥ iij.
Aqua dist	" o ij.

M.–Sig.: – Use a wineglassful as directed.

CROUP.

Croup is an inflammation of the mucous membrane of the larynx. There are two forms of this disease, viz, *true* and *false*.

True croup is known as *membraneous* or *diphtheritic* croup, and is a very grave disease.

False croup is of more frequent occurrence than *true*, but is a less serious affection.

Croup occurs mostly between the ages of two and seven years. If a child is cross and peevish, is hoarse and has a croupous cough, the throat should be examined and if found swollen and spotted here and there with *small firm, white patches*, it is advisable to send for your family physician. If, on the other hand, there are no patches, no anxiety need be felt.

It is not at all rare to see a child, who has been coughing a little during the day, and been hoarse without feeling ill, wake up suddenly in the night with great difficulty of breathing, and a loud barking cough. The child often throws himself about the bed, or springs up, clutches anxiously at the throat. The attack occurs nearly always during sleep and is better as soon as the child vomits, but

recurs again almost as soon as he falls asleep. These are symptoms pointing to false croup, and have caused many a young mother great anxiety, while waiting for the medical attendant to arrive. If, as before stated, there are no patches visible in the throat, it will not be necessary to send for a physician. Apply cloths wrung from hot water, to the throat, and give a teaspoonful of wine of ipecac, which may be repeated every twenty minutes till vomiting occurs.

Children that are predisposed to false croup, should be habituated to the causes of the disease, rather than to enervate them by a systematic over-protection, which tends to increase the liability to attacks. In bad weather, let them be warmly clad but do not over-wrap the neck; keep their feet dry; and let them out-of-doors every day. Washing the throat and face in cold water can not be recommended too highly. Let the application be thorough, and rub dry afterward. Knowing that a child is subject to attacks of false croup will help to determine the point whether the disease is it, or true croup. In false croup there is no, or very slight, fever. In true, it is always present, as can be determined by the thermometer.

The treatment given for false croup will do no harm should the attack prove to be true croup, and will relieve the child until the physician arrives. For cough and hoarseness, with tendency to croup, No. 68 should be given two, three or four hours apart, owing to the severity of the symptoms.

No. 68.

℞

Ammonii Carb.	grs. viij.
Ammonii Chlor.	" xij.
Ex. Eucalyptus fluidum (P. D. & Co.)	fl. ʒ i ss.
Syrup Acaciae	" ʒ ss.
Syrup Wild Cherry q. s. ad.	" ʒ ij.

M.–Sig.—ʒ j in milk or water every two, three or four hours.—"*Col. and Clin. Rec.*"

WINTER COUGH.

Under this term we wish to include the large number of affections of the throat, larynx and bronchi, which gives rise to cough, and are not sufficiently well defined by symptoms, to place them in the list of named diseases of the respiratory tract. Cough is the principal symptom, and it is this the patient seeks relief from.

The temperature of most portions of the United States is liable to sudden variations, which are accompanied by great variation in the humidity of the atmosphere. These changes belong with the uncontrollable causes of disease, and the best that can be done is to guard the system as well as possible against them. The aim should be to maintain the body at all hours and seasons, but especially during the hours of sleep, at an equable temperature. Probably seventy per cent. of the living rooms during the winter season, are kept at a too high temperature. Whenever an individual goes out from a room thus over-heated, it has an identical effect to that of sudden climatic change.

As a result of these causes, a large number of individuals suffer more or less, from catarrhal conditions of the air passages during the winter and early spring months.

No. 69 will benefit most cases, arising from causes as indicated above. It contains the medicinal principles of white pine and wild cherry bark, blood-root and balm of Gilead buds, with other ingredients, and may be safely given to persons of all ages.

No. 69.

℞

Anodyne Pine Expectorant (P. D. & Co.). fl. ℥ iv.

Sig.—℥ j three to six times a day.

If the tongue is coated, take two grains of quinine three times a day. The bowels if constipated, must be regulated as directed under constipation.

WHOOPING COUGH. (*Pertussis*).

Whooping cough belongs among the diseases of children, although it occasionally occurs after childhood, and may at all ages.

The name of the affection is derived from the characteristic sound produced in inspiration, during a paroxysm of coughing.

Symptoms.—The first symptoms are those of coryza and bronchitis; the cough soon becomes more violent than that of ordinary bronchitis. There is more or less fever. The cough increases in severity, and soon becomes distinctly paroxysmal; the distinguishing feature of the disease is, the occurrence of the cough in paroxysms.

The time from the beginning of the affection until the whoop and paroxysmal cough are established, varies from two or three days to as many weeks. The paroxysm consists of a series of expiratory acts following each other so rapidly, that the patient is unable to take an inspiration between them. The number of these efforts which thus follow without inspiration, vary from five or six to twenty, the number depending upon the severity of the paroxysm. A long and labored inspiration then takes place, giving rise to the whoop referred to above. These alternate acts of coughing and whooping are repeated until the paroxysm ends.

During the attack the face is congested, the tears flow abundantly, and frequently vomiting takes place. In severe cases bleeding from the nose occurs, and in exceptional instances, from the eyes and ears. Paroxysms occur in greater number during the night than daytime. Physical exertion, mental excitement and crying, are apt to bring on an attack of coughing. At the beginning of the second stage, or when the paroxysms are fully established, the fever disappears. Whooping-cough may exist without the characteristic whoop being present; this, however, is rare. A little ulcer under the tongue on or at the side of

the *frænum linguæ* is a positive sign of whooping-cough. It is not always present.

Causes.—Whooping-cough belongs to the infectious diseases, the miasm (bacteria) being generated in the bodies of those affected with it. As a rule, individuals are liable to one attack only, but exceptionally the disease is experienced more than once. The period of incubation is from one to two weeks; the duration of the disease is from six weeks to as many months. The greatest danger is when the disease occurs before one year of age, and the danger diminishes as the age increases. The largest number of cases occur between one and five years.

Treatment.—For the cough give No. 70 in teaspoonful doses, four to six hours.

No. 70.

℞

Potass. Brom.	ʒ ij.
Chloral Hydrat	ʒ j.
Syrup Wild Cherry (*P. D. & Co.*)	fl. ʒ j.
Aqua q. s. ad	" ʒ ij.

M.–Sig.—ʒ j every four to six hours as directed.

The above is for a child one year old; the dose can be increased or diminished as required to suit the age; for older children it is advisable to give the same quantity, but give oftener. In addition to the prescription above for the cough, give No. 71, in teaspoonful doses four times a day.

No. 71.

℞

Quiniæ Sulph.	grs. xxxij.
Elixir of Licorice, (aromatic) (P. D. & Co.)	fl. ʒ ij.
Aqua q. s. ad	" ʒ iv.

M.–Sig.—ʒ j four times a day.

Hygienic measures form an important part of the

treatment. The diet should be nutritious, and it is better given in solid than liquid form, as it is less likely to be vomited.

Food should be taken often, and as soon after a paroxysm as convenient. If there are no complications, the patient should be kept out-of-doors, the more the better. The patient's room should be kept well ventilated, and care taken that the temperature is kept at about 65 degrees Fahr. In view of the fact that age lessens the danger from whooping-cough, it is advisable to keep children from contracting it if possible.

HICCOUGH. (*Singultus.*)

Hiccough is produced by a rapid spasmodic contraction of the diaphragm, accompanied by an inspiratory act and closure of the glottis, so that further entrance of the air is prevented. The striking of the column of air upon the closed glottis produces a *sound*, or *hiccough*. It is produced in infants, young children and aged people, by slight irritation of the stomach or duodenum, by swallowing too hastily, by mental emotions as crying or laughing; uterine irritation also often gives rise to it in hysterical or pregnant women; inflammation of the liver or diaphragm or cardiac orifice of the stomach will cause it; lastly, it is common toward the fatal termination of many acute diseases, when it forms an important—because unfavorable—symptom. Hiccough accompanying intoxication, is due to the irritation of the stomach and duodenum by the ingested liquor.

Treatment.—Hiccough is cured by numerous simple practices. One, which is always at hand, consists in making *rapid* and deep inspirations, alternating with *very slow* and deep expirations; another is to press the index fingers firmly into the ears, at the same time drink a few sips of water, the cup being held to the lips by another person; fifteen to twenty drops of vinegar to a teaspoonful of

sugar, eaten slowly, is a favorite remedy with the writer. When hiccough occurs in connection with serious diseases, it may be necessary to have the medical attendant prescribe for it.

ASTHMA.

Asthma may be defined as consisting of paroxysmal attacks of dyspnœa, accompanied with a wheezing sound of respirations. These attacks vary much in duration and severity.

A fit of asthma may commence without warning, or it may be preceded by various digestive, or nervous, or other disturbances. Patients who are subject to this disease, are often able to predict an attack hours before its occurrence. The majority of attacks come on during the latter part of the night or early morning. The paroxysm is characterized by laborious efforts of breathing. There is a painful sense of the want of air, the inspiratory act being performed with more or less spasmodic effort, and the expiratory act is prolonged, and accomplished with a wheezing sound. The patient cannot lie down, and sits with the elbows resting on some solid support, to facilitate the action of the respiratory muscles; the head is thrown backward, the mouth open and gasping with each inspiration. The patient suffering from a severe paroxysm, presents a most pitiable sight; to one unfamiliar with the disease death seems imminent. The paroxysm is usually followed by cough and expectoration, which may be streaked with blood.

The attacks recur with varying intervals, both as regards duration and regularity. Some persons experience an attack after the interval of a week, others annually, and it may occur winter or summer. Examples of the latter are cases of so called hay asthma. The respirations are not increased, but may be less in number than in health; the pulse is feeble and somewhat increased in frequency.

Causes.—The cause of asthma is obscure. Still there is little doubt that the primary cause has its seat in the nervous system, and so influences the system that it is easily affected by certain agencies. The exciting causes are equally obscure in many instances. There are, however, many of these well known.

A striking example of an exciting case is the emanations of new mown hay, many persons suffering from asthma whenever exposed to this cause. The term hay asthma or hay fever, however, is applied to cases occurring exclusively during the summer season, although the exciting cause may not have proceeded from hay. The pollen of ragweed (*ambrosia artemisiæfoli*) is an active and exciting cause in many localities.

Hay fever seems to be rapidly increasing for a few years past, judging from the large number of persons who find it necessary to visit annually localities exempt from the influence producing it. It is a question if many of these cases are not as much dependent upon a desire to be fashionable as the emanations from hay or ragweed. It may seem very improbable, but every physician knows that diseases are fashionable with the Ward MacAllister classes, as are also remedies.

Some individuals find it impossible to sleep upon feathers without suffering from an attack of asthma. Others are affected by the emanations from the horse or other animals, as the cat, rabbit, etc. Overloading the stomach is an exciting cause, as is indigestion or constipation. Many females suffer from asthma during the menstrual period, and at no other time. Climatic influences are an important factor, not only as relates to the cause, but treatment of this affection. Asthma occurs at all ages. It is more frequent in males than females, the proportion being two to one.

Treatment.—This should be directed first to relieving the patient's suffering, and second to prevent a recurrence

of it. To accomplish the first, give a teaspoonful of No. 72 as soon as the paroxysm is noticed, and repeat every three hours if necessary to give relief. If the paroxysm is already well commenced, give in teaspoonful doses every hour until three doses have been administered; then at longer intervals as may be required.

No. 72.

℞

Chlor. Anodyne (P. D. & Co.)	fl.	ʒ ij.
Fl. Ex. Lily of the Valley (P. D. & Co.)	"	ʒ j.
Tr. Lobelia	"	ʒ iv.
Syrup Scillae	"	℥ j.
Syrup Simp	"	℥ iv.

M.–Sig.—ʒ j every three hours or oftener, as directed.

To prevent a recurrence use No. 73, which originated with Sir Morrell Mackenzie.

No. 73.

℞

Zinci Valerianat	grs.	xxx.
Pil. Asafoetidae comp	ʒ	j.

M.–et ft. pilulae No. xxx. Sig.—One pill three times a day.

Alternating with these pills take two grains of quinine three times a day. Avoid the exciting causes as far as possible and pay due attention to all hygienic measures. If there is any locality in which the patient is free from attacks, it is advisable that such locality be made his or her home, even at a sacrifice. The life of an asthmatic sufferer is anything but pleasant. Paroxysms of asthma never prove fatal.

BRONCHITIS.

Bronchitis is an inflammation of the mucous membrane lining the bronchial tubes. It may be either acute or chronic.

Acute bronchitis is usually preceded by coryza, and is

popularly known as "cold on the lungs." At the beginning of the attack there is slight chilliness, a little fever and an increased frequency of the pulse; the appetite is impaired; there is lassitude, and a general ill-feeling. The cough is at first painful, but not to a marked degree. The expectoration is at first small, but becomes abundant in the course of three or four days, and is then thick and yellowish. Respiration is not materially changed. The average duration of the disease is ten to twelve days.

Causes.—Exposure of a portion of the body to a current of air is the most common cause, while the whole body may be subject to much greater exposure without bronchitis following. The exact phenomenon of "taking cold" is not easily explained. The general theory advanced is, that the surface of the body becoming chilled, the coats of the external bloodvessels are contracted, thus forcing the blood to the internal vessels situated in the membranes lining, the air passages, alimentary tract and abdominal cavity. This produces a congested condition of these membranes, which in many instances, terminates in a real inflammation. This theory is plausible, but does not explain why the same results do not always follow. It is a well known fact, that individuals are often exposed to the severest climatic changes without any ill effects following; again a person is obliged to sit for hours in a draught, expecting a "death cold" is being contracted, but to his great surprise no bad results follow; this, and the fact that a cold is always contracted when not expected, would seem to point to the nervous system as playing an important part. Just what this is, or its *modus operandi*, we are not prepared to state. That the system can be "nerved up" to withstand many influences which otherwise affect the health disastrously, is as important as true.

Bronchitis is sometimes epidemic. It also occurs secondarily to and forms an element of other disease; as such it belongs as a symptom of measles. It may be produced

by the inhalation of irritating gases and powders. The liability to this disease is less in proportion as persons are habituated to out-of-door life. Soldiers, hunters and explorers, who are accustomed to sleeping in tents or in the open air, rarely take cold.

Treatment.—The treatment for acute bronchitis is the same as that given for acute nasal catarrh.

CHRONIC BRONCHITIS.

A persisting inflammation of the bronchial mucous membrane, constitutes this disorder. It is generally a sequel of the acute form, and when such, is dependent upon the same causes.

Chronic bronchitis occurs much oftener after than before middle life. It is unattended with pain, fever, or other marked symptoms of constitutional disturbances. Cough always exists, but varies much in frequency and severity in different cases. Expectoration varies also in quantity and appearance. As a rule it is composed of mucus and pus, occasionally streaked with blood.

Treatment.—Every effort should be made to build up the general health by a generous diet, out-of-door life, etc. Change of climate is at times very beneficial. A mild and equitable climate is best. For the cough take No. 74 four times a day.

No. 74.

℞

Ammon. Muriat		ʒ j.
Syrup Senegae	fl.	ʒ ss.
Tinct. Opii Camph	"	ʒ j.
Syrup Tolutanus	"	ʒ ss.
Aquae Gaultheriae q. s. ad	"	ʒ ij.

M.–Sig.—ʒ j four times a day.

In cases of chronic bronchitis occurring before fifty years of age, we advise taking No. 75 in teaspoonful

doses three times a day after meals for three months at least, taking No. 74 as directed.

No. 75.

℞

Syrup Trifolium comp. (P. D. & Co.) fl. ʒ iv.
Potass. Iodidi . . . . . ʒ j.

M.–Sig.—ʒj three times a day after meals.

INFLUENZA, LA GRIPPE, EPIDEMIC BRONCHITIS.

Epidemic bronchitis has extensively prevailed in this country during the past two winters (1889-90 and 1890-91), under the French name *La Grippe*, or Americanized, "the grip."

The disease has been known amongst medical writers for four or five centuries, under the name of influenza, an epidemic of it occurring in this country in 1832. As an epidemic it is remarkable for its extensiveness and rapid diffusion, attacking all ages and classes simultaneously.

Of itself influenza is not a fatal disease, but it is liable to lead to the development of other affections, which are more apt to prove fatal, when so developed, than ordinarily. This is especially true of pneumonia.

Symptoms.—These are at first similar to an ordinary cold, with more or less sneezing, and a watery discharge from the nose. Frontal headache is a prominent symptom. The inflammation is apt to extend to the throat, eyes and ears. The cough varies in different cases. There are usually chills, fever and lassitude; the patient complains of feeling "sore all over, and aching." Toward the end of the disease there is frequently a free perspiration and in some cases diarrhœa.

Causes.—Influenza is without doubt, due to vegetable germs (bacteria) which are present in the atmosphere. Their origin is not well established. Climatic changes are generally supposed to have a direct influence upon the

prevalence of this disease. This no doubt is largely due to the fact, that the seasons above referred to have been unusually changeable, and the atmosphere overcharged with moisture. During the epidemic of influenza in 1832, the wards of the Massachusetts General Hospital were kept at a uniform temperature day and night, still nearly all the patients were affected; this we think goes far towards disproving the theory that the grip is due to the weather.

Treatment.—As soon as symptoms of influenza are noticed, a sufficient amount of epsom or rochelle salts should be taken to freely evacuate the bowels, and as soon as this occurs take No. 76, a capsule every four hours, alternating with it two grain doses of quinine; the latter should be given at an hour midway between the hours for the former.

No. 76.

℞

Phenacetine .... 3 j.

Div. and put into capsules No. xv. Sig.—One capsule every four hours as directed.

During the attack, the patient should remain indoors and abstain from all business or other cares. The diet should be light. Influenza ordinarily continues from four to eight days.

PLEURISY. (*Pleuritis.*)

This is inflammation of the *pleura*, or sac surrounding the lungs. It will be learned from the description given in Part I that the pleura is a closed membrane, one layer lining the walls of the thorax, the other covering the lungs, the two serous surfaces facing each other. The inflammation is located in the inner surface, and the pain is caused by the two inflamed surfaces rubbing together by the movements incident to inspiration and expiration. One of the results of inflammation of serous membranes is the effusion (pouring out) of liquids. This takes place

in pleuritis, and commences in a few hours after the attack, and may continue from two to five days.

Symptoms.—As a rule, pleuritis comes on suddenly. Occasionally slight pain is felt for a day or two previous to the attack. There is a chilly sensation at first; sometimes a decided chill. Pain is soon felt in the affected side. It is intense, cutting or lancinating, and is increased by inspiration, coughing or sneezing. The pain is situated between the sixth and ninth ribs at the side, and may extend forward or backward. The pulse is increased in frequency; there is fever, headache, thirst, and muscular weakness, with pain in the loins. From the increased pain from coughing, the patient endeavors to suppress it. Expectoration is slight; respiration is increased. The patient lies upon the well side. As soon as the liquid is effused the pain is diminished, and may disappear altogether; the fever subsides; the acts of coughing are less painful; the patient considers himself better, sits up, or perhaps walks about the room; the patient sometimes feels so much improved that he resumes his occupation. Serious results are liable to follow if the patient overdoes at this stage. The fluid that is within the pleural sac distends it, and the inflamed surfaces are no longer in contact, which explains the subsidence of the pain. The respiration continues frequent. At this stage the patient prefers to lie upon the affected side. This is particularly true if the amount of liquid within the cavity is great.

Causes.—In the majority of cases pleuritis seems to be due to the action of cold. It is sometimes the result of wounds. It occurs much more frequently in youth and middle age than in childhood or old age.

Treatment.—The treatment of acute pleurisy should be left to the family physician. If a doctor cannot be obtained, give for the first thirty-four hours:

No. 77.

℞

Pulv. Ipecac et Opii	ʒ ij.
Syrup Simp.	fl. ℥ j.
Aquae q. s. ad.	" ℥ ij.

M.–Sig.—℥ j every two, three or four hours as required to allay pain.

The above should be given in teaspoonful doses every two, three or four hours, to quiet the pain, and in addition put five drops *tincture aconite* into a goblet of water, and give a teaspoonful every fifteen minutes. Apply mustard to the side, but do not blister. As soon as the pain has been quieted, give a tablespoonful of epsom salts, and repeat in four hours to procure a free movement of the bowels. After forty-eight hours, or as soon as the pain is better, No. 77 need not be given so often, and should be left off after taking the salts till an evacuation occurs, unless the pain returns.

During the second stage (after forty-eight hours) the bowels should move every day freely. Salts may be given for this. The patient should be allowed *very little liquid* of any kind, and means be employed to cause perspiration. The room should be kept at a temperature of about sixty-five degrees, the patient kept warmly covered and given a nutritious diet.

CHRONIC PLEURISY.

The fluid effused, as described under acute pleuritis, instead of being absorbed occasionally, remains within the pleural sac for an indefinite period. This condition constitutes chronic pleurisy. Fluid is sometimes accumulated within the chest without being preceded by the symptoms of acute pleurisy.

Symptoms.—Unless it is an extreme case (when the affected side will be noticeably enlarged) it will require a skillful physician to diagnose the condition. If coughing

is produced when the patient lies down or gets up; if there is shortness of breath, and cough; if the patient lies constantly on one side, it is pretty good grounds for suspecting that this affection exists, and the family physician should be called. He will probably remove the fluid by an operation called *thoracentesis*. This consists in passing a trocar in through the chest wall and drawing the fluid off. The operation is attended with little pain or danger, and the surgeon should be given liberty to operate as soon as in his judgment it is necessary.

The fluid, remember, is on the outside of the lung, not in it. This disease is sometimes double, that is, both sides are affected.

HYDROTHORAX.

This means, literally, water in the chest. It is not due to any disease of the pleura or lungs, but occurs in connection with dropsy in other locations, and arises from the same causes. It is always double, although one side of the chest may contain more liquid than the other.

Treatment.—Is the same as for general dropsy.

INFLAMMATION OF THE LUNG.

(*Pneumonia, Pneumonitis.*)

These terms are all used to denote the same condition, which is an inflammation of the lung tissue. A part or the whole of one lung may be attacked, or even both lungs.

Symptoms.—Ordinarily the symptoms of pneumonia are highly distinctive. The majority of cases begin after exposure to cold or wet, with a chill followed by febrile action, together with a sharp pain at or just below the nipple; more or less cough, and a temperature in the axilla ranging from 103 degrees to 105 degrees, in severe cases still higher. The thermometer will often show a rise of temperature while the patient is suffering from the

chill. The expectoration is at first scanty, transparent, and viscid, but soon becomes of a reddish color, resembling iron rust; to this characteristic expectoration has been given the name *rusty sputa.* It is very adhesive, and is positive evidence of pneumonia, as it is present in no other disease. The pulse is increased in frequency, ranging from 80 to 120 beats per minute; there is pain in the head, loss of appetite, thirst, prostration, heat of the skin, etc.; respiration is increased. If a large portion of the lung be involved, respiration will be increased to a greater degree than if the inflammation is limited to a single lobe.

In some cases one or both cheeks are unnaturally red, the margin of the redness being abruptly defined. The urine is generally diminished in quantity.

Causes.—Not infrequently the disease can be traced to unusual exposure, such as working in the cold and water, sleeping out-of-doors at night. It often follows after a debauch, which has led to the belief that intemperance caused the disease; it is more likely that the exposure incidental to the debauch gave rise to it. One thing, however, is well established in reference to this affection, viz., individuals addicted to the use of alcoholic stimulants, are less likely to recover from an attack of it than those of temperate habits; this is true of all disease, but more especially the one under consideration. Pneumonia is frequently developed in the course of typhoid and typhus fever, and in measles. It occurs at all periods of life, but cases are most frequent between the ages of twenty and forty. It is rare before the age of five years, or after sixty. Pneumonia is seen oftener in males than in females, due doubtless to the former being more exposed to the vicissitudes of the weather. When pneumonia is of a *severe* type attended with delirium of a low, muttering character, the term typhoid-pneumonia is given

to it, and does not mean that the two diseases are both present.

Treatment.—If an attack of pneumonia is early determined, its severity can be very greatly lessened by using No. 78, taking it in two doses, two hours apart.

No. 78.

℞

Quiniae Sulph..... grs. xij.
Pulv. Opium..... " j.

M. and put into four capsules. Sig.—two capsules at one dose every two hours.

Apply a mustard plaster to the painful side, but do not blister. It will not be advisable to attempt to treat this affection further than indicated above, without the family physician's aid. If the patient has been exposed to cold or wet, and has headache, perhaps pain in the back, a chill with sharp pains in the side, and an increase of temperature to 102 degrees or 103 degrees or more, it will be good treatment to give No. 78 as directed. Even should the attack be something else than pneumonia—which is not probable—it will do no harm. The physician should be early called. The tendency of pneumonia is toward recovery. The average duration of the cases which recover, is about thirteen days; in fatal cases it is three to four days less.

CONSUMPTION OF THE LUNG.

(*Phthisis pulmonalis.*)

The term consumption is the one generally applied to this disease. It is also known as *phthisis*, and *the decline*, names which are significant, in view of the wasting of the body which attends its march, yet not sufficiently definite, inasmuch as many other affections are attended with progressive emaciation.

Of the diseases which afflict the human family, consumption, the great white plague, is the most important,

prevailing as it does in every quarter of the globe. Physicians of all lands have vainly endeavored to check its ravages. Year after year, in utter disregard of science, it has continued its unholy sway, sweeping off millions of human beings, until every hamlet and village has learned to speak of it with bated breath. Of all deaths, one-sixth are caused by consumption of the lungs; and in two-fifths of the cadavers examined, germs are found from which consumption proceeds. There is no subject at the present time receiving so great attention from medical writers as the prevention and cure of this affection. As to the final result we dare not predict, but hope that a remedy may be found which will prove effective.

If one attack of consumption prevented a recurrence of the disease, as in small-pox, there would be greater reasons to expect Prof. Koch's theory to eventually succeed; there is, however, no evidence of this. It may be expected that the disease will be arrested, in many instances, if an agent can be discovered, which, when introduced into the blood will destroy the bacilli, or even render them inactive, provided an early diagnosis is made. Until such time, we can only use the knowledge already furnished us by science to check the spread of the disease, and palliate the already existing cases.

Symptoms.—The development of consumption is insidious, the patient or friends often not suspecting it until well advanced. A dry, hacking cough, continuing for some time, with a temperature in the axilla above normal, should always excite suspicion. If these be attended by pleuritic pain, or pain in the region of the clavicle, and slight fever toward evening, the grounds for apprehension will be greatly increased. If in addition to the above there is diarrhœa, not caused by indigestion, loss of weight, impaired appetite, increased expectoration or hæmoptysis, suspicion becomes confirmed.

These are symptoms which occur toward the com-

mencement of the disease; as it advances the fever is greater and there is usually a chill, more or less severe at some period during the twenty-four hours; "night sweats" follow the fever, the expectoration is increased and is composed of mucus and pus; diarrhœa is also increased, the dejections indicating ulceration; the stitch-like pains continue in the sides; muscular strength gradua'ly diminishes; emaciation becomes marked; the thermometer shows a temperature of from 100 degrees to 102 degrees; the feet and ankles are more or less swollen, denoting failure of the circulation.

These symptoms, exhibiting different degrees of intensity, continue for a variable duration of time. Generally the disease is chronic, but sometimes it runs a rapid course, destroying life in a few weeks. The name "galloping consumption" has been applied to the disease in such cases. Hoarseness, or huskiness of the voice, denoting chronic laryngitis, is strong evidence that consumption exists.

To recapitulate, the symptoms pointing to this affection are: 1st. Cough not due to other disease, at first dry and hacking, later, accompanied by expectoration which is at the commencement glossy, afterward becoming opaque, and more abunda nt. 2d. Increase of temperature, varying from 99 degrees to 100 in the beginning, and afterward from 100 degrees to 102. 3d. Sharp, lancinating pain in the side and at the apex of the lung. 4th. Chills not caused by malaria. 5th. Hæmoptysis; this is a valuable symptom but is not always present, and may occur independent of consumptom. 6th. Increased respiration. 7th. Loss of weight, attended with pallor. 8th. Chronic inflammation of the larynx, indicated by hoarseness and huskiness of the voice. 9th. Suppression of the menses. 10th. Buoyancy of mind instead of despondency. A knowledge as to whether or not consumption has previously existed in either branch of the family, will help to a diagnosis of the case.

Causes.—It is now well established that consumption is caused by vegetable germs called *bacilli* (singular bacillus) a variety of *bacterium.*

It is also well established, that a predisposition to this disease is hereditary, but why a peculiarity of constitution, rendering a person especially liable to the development of consumption, should be transmitted from parent to child, is not more easily explained than the fact, that traits of character, disposition, etc., are inherited. Neither is it easy to explain why some members of a family of the same parentage are exempt while others are attacked. These, however, are facts which come under the notice of every observant practitioner.

Consumption is developed at all periods of life, and may affect the child previous to birth; twenty to thirty years of age is the period in which it is most likely to occur. Another point in reference to this disease, which is pretty generally accepted is, that it is transmissible. This takes p'ace by the expectoration, which contains the bacilli becoming dried, and the dust-like particles (bacilli) floating through the air, are carried into the lungs and stomachs of other individuals, and finding congenial soil, germinate and increase until the system is thoroughly impregnated with them, and disease becomes manifest. Another source of infection, which has not received the attention it should, is the use of milk from cows affected with consumption. The "Chicago Tribune" reports Dr. Bayard Holmes, of the Bacteriological Laboratory of the Chicago Medical College, as saying upon this point:

"That the germs of disease have been implanted in the human body by impure milk, has been demonstrated in numberless instances. The bulk of tubercular affections is directly attributable to the use of milk in which the tuberculosis microbe has secured a lodgment. It is the same microbe that has been so generally known through the recent investigations of Prof. Koch. It is present in

cows suffering from tuberculosis, and is transmitted directly through the milk. A large percentage of the cases of cholera infantum and so-called summer complaint are directly attributable to the use of milk taken from tubercular cows. This is proven by clinical evidence. Summer complaint, diarrhœa, and other intestinal diseases of children are also due to the use of milk which swarms with bacilli of various kinds. There are over fifty varieties of this sort of bacillus found in impure milk."

When the American people come to think more of health than money, the diseased animals will, by official direction, be sent to the soap or fertilizer manufactory, rather than to market to be sold for dairy purposes. Every animal used for supplying milk, should be rigidly examined by a competent veterinary surgeon, and if found diseased, ordered killed, and the owner compensated by the government. If this mode of disposing of discarded cows were adopted, the owners of such, instead of selling them to some one else, to save the loss, would report to the proper authorities whenever any animal showed symptoms of disease. In time this would result in removing one source of this terrible malady. As long, however, as such reforms are dependent upon party politics, it cannot be expected that any very beneficial changes will occur. A few thousand deaths, annually, of the fair sons and daughters of the republic, are nothing compared to the ambition of some petty politician whose highest conception of statesmanship is intriguing for re-election and party supremacy.

Treatment.—As before stated, it cannot be expected that consumption will be entirely prevented or cured, until such time as science shall produce an agent capable of destroying the germs, which give rise to it. With our present knowledge, much, however, can be done to lessen the number of cases, and palliate the suffering of those who are so unfortunate as to be afflicted with the disease.

It is only when the vitality is lowered, that the conditions seem favorable for the germination of the bacilli, which have found lodgement within the body. This fact plainly indicates the line of treatment for those who are thrown into connection with consumption, or have reason to suspect that they have a hereditary predisposition. Every effort should be made to keep the system in the best possible tone, by employing such measures as tend to strengthen and invigorate. These relate to hygienic regulation in reference to diet, exercise in the open air, clothing, and climate. The diet should be generous as regards quantity, quality and variety; no rule can be laid down as to the kinds of food, as what agrees with one, does not with another.

Pure milk, cream, butter, honey, sugar, lean meats, vegetables and fruits, in fact, any article which is nourishing and agrees with the patient's stomach, can be eaten. Out-of-door life is of first importance to those with such tendencies as are mentioned above, and no person predisposed to consumption can afford, under any circumstances, to choose or continue an occupation which necessitates remaining very much excluded from an abundance of pure air and sunshine. Exercise in the open air should be conjoined with either recreation or occupation which interests the mind. Exercise simply as a hygienic measure will rarely be persisted in. Over-exercise should be avoided, care being taken that it is not carried to the point of fatigue. Many patients get the idea that the benefit from muscular exercise is in proportion to its amount, and carry it to excess.

The sleeping apartments should be well ventilated. Don't fear the night air. If necessary, have a fire in the sleeping room, but the windows should be kept open, day and night. Endeavor to preserve the functions of the skin by means of the sponge bath, taken at a temperature of from 65 to 70 degrees, and wearing next it either wool

or silk. Care should be taken not to wear an over-abundance of clothing, as it tends to retain the moisture of the body, and defeats the object for which it is used.

As regards change of climate, if done at all it should be early in the course of the disease. Do not wait till the strength is so far used up that the fatigue incident to the change distresses the patient. We have often seen patients with no hope of recovery advised by their physicians to try a change of climate. They were thus deprived of the associations and comforts of home and friends, with no probability of improvement,—truly a cruel act.

Hæmoptysis. This symptom often requires special treatment. Its occurrence usually frightens the patient and friends. There is, however, no occasion for alarm.

It is often a question whether the blood coughed up comes from the lungs or throat. If from the lungs, it is usually *bright* red and frothy, from the little bubbles of air it contains; if from the throat, these will be absent, and it will have a darker color. To arrest the bleeding nothing is better than *spirits of turpentine*, which should be inhaled, and for this a teapot filled to the internal opening of the spout with water warm enough so it gives off steam, can be used. Pour a half teaspoonful of the turpentine into the water, and then let the patient take the spout in the mouth and inhale the fumes. It should be commenced gradually. As an internal remedy use No. 79 every two hours:

No. 79.

℞

Fl. Ex. Ergotae (P. D. & Co.)	fl.	ʒ iij.
Tinct. Opii	"	ʒ ij.
Acid Gallic		ʒ jss.
Syrup Simp		℥ ss.
Aqua q. s. ad		℥ ij.

M.–Sig.—ʒ j every two hours.

In case of hæmoptysis in a woman who is pregnant, the first named medicine in the above prescription had better be left out. The patient should be kept quiet, the shoulders well raised, and the room kept at a temperature not above 60 degrees. The feet should be kept warm by wrapping in flannel or placing hot irons, etc., to them. Swallowing pieces of ice is beneficial. For the cough attending the disease the following is most excellent in a large number of cases:

No. 80.

℞

Syrup Tolutani	aa. fl. ʒ j.
Syrup pruni Virg	
Tinct. Hyoscyami	
Potass. Iod.	ʒ ij.
Aqua q. s. ad.	fl. ʒ v.

M.-Sig.—ʒ j three to six times a day as required.

If there is much pallor or supposed scrofula, it will be good treatment to take No. 81 at the same time as No. 82. Each can be taken three times a day, No. 81 after meals, and the cough mixture (No. 80) two or three hours later.

No. 81.

℞

Syrup Trifolium comp. ..... (P. D. & Co.)	aa. fl. ʒ v.
Syrup Haematic hypophos .... (P. D. & Co.)	

M.-Sig.—ʒ ij after meals.

For the pleuritic pain which occurs in the course of consumption, apply a *Belladonna Plaster* to the side and leave it as long as it will remain. For the night sweats of consumption use No. 82.

No. 82.

℞

Zinc. Sulph	grs. vj.
Ex. Hyoscyami	" xxiv.

M, et div. in pilulae No. vj. Sig.—One pill every night.

Bathing in equal parts of cider vinegar and water at a temperature of 80 degrees to 90 degrees will sometimes control the perspiration. The two can be used in bad cases.

In concluding this very important subject we wish to impress upon all our readers the necessity of hearty coöperation in an attempt to confine consumption within the narrowest possible limits. It must be remembered that the tuberculosis bacilli are spread: 1. Mostly by means of the discharge from the lungs of tuberculous persons. 2. The dried and powdered discharge is particularly dangerous in this respect. 3. The ordinary means of disinfection are quite insufficient to check their ravages. In consideration of these facts, care should be taken that the discharge from the lungs of consumptive patients is properly cared for, not allowing it to become dried.

Receptacles containing fluid should be used, and when necessary to dispose of the contents, it should be buried. Public buildings, schoolrooms, stores and factories should be supplied with cuspidores for the use of persons with lung trouble, and the accumulation cared for as above directed.

Marriage of Consumptives.—The almost universal opinion of medical authorities is, that individuals with this affection should not marry. This conclusion is arrived at from the oft observed fact that marriage hastens the development of the disease. The principal objection to such marriages, however, is that children result from the issue, who in turn marry and become the parents of others. Thus the disease is perpetuated. Consumptive mothers should not nurse their offspring, not only on the child's account, but their own.

CHAPTER X.

DISEASES OF THE URINARY ORGANS.

BRIGHT'S DISEASE.

Bright's disease is characterized by the urine containing albumen in greater or less quantity. This morbid condition was first pointed out by Dr. Bright of England, in the year 1827, and since that time has been known under the above name. It may be either acute or chronic. In the former it occurs usually as a sequel to other diseases.

Symptoms.—The first thing usually which attracts attention, is "puffing of the face," just below the eyes; very soon afterward the feet and ankles begin to swell. Coincident with the above is more or less febrile movement, preceded by chills, together with thirst; headache and pain in the loins; vomiting occurs in the majority of cases. The dropsy increases, becoming general, but varying as to quantity. The urine is dark colored, is scanty, and contains albumen which can be ascertained by the following process, requiring a *test tube*, an alcohol lamp, some chemically pure *acetic acid*, *nitric acid* and *liquor potassa*, in separate bottles. Put into the test tube about two teaspoonfuls of urine, add from two to four drops of the acetic acid, then heat over the lamp till it boils. If the urine becomes cloudy, it is due to either albumen or other substance; now add three to seven drops of the nitric acid, and if the cloudiness does not disappear, it is evidence that it is due to albumen. If instead of the nitric acid liquor potassa be added, after boiling, the cloudiness is removed, if due to albumen.

Coma and convulsions occur in a certain proportion of cases, and is cause for alarm.

Causes.—As stated above, this affection is most liable to follow after scarlet fever; it also occurs after diphtheria, acute rheumatism, typhoid fever, measles and some other diseases. In a majority of instances, it seems to be brought about by influence of cold. Some authors claim it occurs without any chilling of the surface.

Acute Bright's Disease occurs independent of the disease named above. It is quite apt to follow debauch attended with bodily exposure.

Treatment.—This should be with a view to relieving the system of the accumulated poison, urea, which causes the convulsions, and is the immediate source of danger. For this purpose, nothing equals the hot air bath.

For helping to rid the system of the urea, give No. 83 every two hours until the four powders are taken.

No. 83.

℞

Potass. Bitartras	ʒ ij.
Pulv. Jalapae	grs. x.
" *Zingiber*	" xx.

M. et div. in pulv. No iv. Sig.—One powder every two hours.

These will cause a free evacuation of liquid stools, and greatly relieve the kidneys. Medicines to act upon the kidneys should not be given, as they do more harm than good.

Chronic Bright's Disease is a much more serious disorder than the acute. It points to degenerative changes of the kidneys.

The diagnosis and treatment of this affection should be left to a skilled practitioner. The appearance of dropsy, denoted by swelling of the lower eyelids, feet and ankles, with loss of strength, pallor of the countenance, dry, harsh skin, frequent passing of the urine, should always excite

suspicion, and a physician be consulted. If you have chronic Bright's disease, do not spend your money or time on patent "cure-alls," or highly advertised specialists. Your family physician can do you more good than any one else, and we advise you to give him your confidence, ask for an honest opinion, and abide by it.

Many of the so-called cures of this disease are nothing but cases of irritation of the bladder, but which are really more annoying and painful than true Bright's disease.

DIABETES.

By the term diabetes, is meant simply increased flow of urine. It is applied to two affections, which differ very materially from each other. The one, *diabetes insipidus*, consists in the discharge of an abnormal amount of urine containing little or no solid materials. In the other, *diabetes mellitus*, the urine is also very greatly increased, and contains sugar. The former affection is not so destructive to life as the latter. To distinguish one from the other requires a chemical analysis of the urine, which must be left to the family physician, as should also the treatment. He will be able to give directions as to what may or may not be eaten. Diet is an important factor in the treatment, and the patient should endeavor to carry out the directions in this respect. The advice given under Bright's disease, as to taking other remedies than those prescribed by the medical attendant, is also applicable here.

One of the most troublesome symptoms in this affection, is the great thirst. The following, prescribed by Dr. Duchenne, No. 84, will relieve this :

No. 84.

℞

Potass. phosph..... ..... 3 j.
Aqua..... fl. ʒ v

M.–Sig.—3 j to ij three to six times a day.

GRAVEL.

When a patient discharges gritty powder, or sand, or small calculi, with the urine, it is termed "a fit of the gravel." These are usually reddish in color, and are formed from the combination of uric acid and lime. When grayish in color, they are composed of either phosphate or carbonate of lime. In the former case the urine will be acid in reaction, in the latter alkaline.

These deposits are first formed in the kidneys, and in order to reach the bladder have to pass through the ureters (see engraving No. 11); when small no attention is paid to them, but when their size is greater than the opening through the ureter, severe pain is caused by the passage. This is in proportion to the size and roughness of the calculus. The pain thus produced is known as *nephritic colic.*

Symptoms.—The pain of nephritic colic is, as a rule, developed suddenly, becoming almost immediately intense. The pain is located at the side of the spinal column, just at the lower border of the ribs. From this point the pain radiates in different directions, but especially in the direction of the bladder, sometimes passing to the groin and thigh. In males pain is usually felt in the testicle, which is drawn upward. A very important symptom, and one which is seldom absent, is the almost constant desire to pass urine, which is greatly diminished, only a few drops being voided at a time. The patient tries different positions, hoping to get relief. The countenance denotes suffering; is pale, and sometimes covered with perspiration. If the attack continues for a little time there is thirst, vomiting and coldness of the surface. After varying considerably in different cases, the pain suddenly ceases, followed by a free discharge of urine, which may contain blood. At the discontinuance of the pain, the calculus has reached the bladder, and is usually discharged with the urine. If it remains in the bladder and

increases in size, it constitutes what is known as *stone in the bladder*. A person who has had one attack of nephritic colic is liable to others. It may recur at periods more or less remote.

Treatment should be with a view to relieving the patient's suffering. This will not be complete until the calculus reaches the bladder. Remedies to palliate should be employed. To the *back* apply No. 59, as directed for lead colic, and give internally twenty drops of *tincture of opium* (laudanum), which can be repeated in an hour if the pain does not subside. If this is not at hand twenty drops of chloroform in a teaspoonful of glycerine may be given, or the following prescription (No. 85) in tablespoonful doses every hour till pain is relieved:

No. 85.

℞

Chloral Hydrat.	grs. xl.
Syrup Acac	fl. ʒ ss.
Syrup Chocolate	" ʒ j.
Elix. Simp.	" ʒ ss.

M. Sig.—℥ iv every hour till pain is relieved.

If at the end of the first hour the pain should be somewhat better, it may not be necessary to give more than a half dose. In giving medicine to relieve pain, it should always be borne in mind that *only sufficient should be given to relieve*,

INCONTINENCE OF URINE.

This condition is met with in both adults and children. In the former it is the result of *over-distension;* in the latter the neck of the bladder ceases to act as soon as the influence of the will is withdrawn, as during sleep, giving rise to *nocturnal incontinence*, or "bed-wetting." The child is generally brought to the physician because of this, and too often the history reveals the painful fact that

punishment has been severely tried before professional advice was sought. No good can come from such a course. Moral suasion will accomplish infinitely more.

Causes.—Incontinence in children may be due to pin worms in the rectum. These should be treated by injecting into the rectum night and morning about four ounces of warm infusion of *quassia chips*, made by pouring over one-quarter ounce of the chips a quart of boiling water and allow to stand twelve hours. The following may be used as an injection :

No. 86.

℞

Calomel ..... grs. iv.
Mucilage of Linseed ..... fl. ʒ iv.

M. Sig.—Use half at night and balance in the morning as an injection.

Sometimes the incontinence is caused by a too long foreskin, or from its being adhered to the gland. This condition requires the advice of a surgeon. If not arising from the causes named above, it is probably due to a morbid condition of the muscular coat of the neck of the bladder, and the following (Nos. 87 and 88) should be given in teaspoonful doses each three times a day :

No. 87.

℞

Tinct. Ferri. Mur. ..... fl. ʒ j.
Simp. Elixir q. s. ad. ..... " ʒ ij.

M. Sig.—ʒ j three times a day before meals as directed.

No. 88.

℞

Tinct. Belladonnæ ..... fl. ʒ j.
(Made from P. D. & Co.'s normal liquid)
Simp. Elixir ..... " ʒ ij.

M. Sig.—ʒ j three times a day two hours after meals as directed.

Nos. 87 and 88 are for a child from six to twelve years

of age, above twelve give one-fourth more, previous to six years diminish one-third.

In addition to the above remedies, care should be exercised to see that the child empties the bladder the last thing before retiring, and once during the night, and should be taught to sleep on the side; sleeping on the back congests the spinal cord and leads to incontinence and other disorders. A large handkerchief with a knot in it, tied about the waist so the knot comes over the spine will tend to prevent the child sleeping on the back.

Incontinence in a child during the daytime points to irritation of the bladder, and a surgeon should be consulted, as the irritation may be due to the presence of a stone. Incontinence in the adult will also require the advice of a surgeon.

RETENTION OF URINE.

This term denotes that the urine is retained within the bladder. It occurs in numerous instances, such as paralysis, injuries to the brain, and in great prostration in acute disease. The introduction of a catheter is usually required to relieve it. A surgeon should be called for the operation the first time, and if there is no great amount of obstruction, the nurse can usually perform it afterward by following the instructions given by the surgeon.

Suppression of the urine means that very little, or no urine is secreted by the kidney. If persistent it is always fatal. The hot air bath is the quickest and best remedy.

HÆMATURIA OR BLOODY URINE.

This occurs as a symptom of other diseases, and as such will be treated in its proper place. Its occurrence in connection with "a fit of the gravel" has already been noticed. It sometimes occurs after active muscular exercise, and usually causes great alarm; this is unnecessary,

as it usually results in no harm. The following (No. 89) will correct the trouble, arising from such cause, in a few hours:

No. 89.

℞

Tinct. Ferri Mur..... ..... fl. ʒ ss.
Fl. Ex. Belladonnae (*P. D. & Co.*). " ʒ ss.
Simp. Elixir q. s. ad..... ..... " ʒ ij.

M. Sig.—ʒj every four hours.

CHAPTER XI.

DISEASES OF THE NERVOUS SYSTEM.

DELIRIUM TREMENS. (*Alcoholism.*)

This disease is known, vulgarly, by numerous names, such as "snakes in the boots," "tremors," "horrors," "jim-jams," etc.

Symptoms.—The first symptom that attracts attention is inability to sleep; this is followed by muscular tremor, especially of the tongue, and great mental depression; this latter often leads to suicide. These symptoms continue for two or three days, and unless relief is obtained, are followed by complete development of the disease, in which the mental derangement is marked. The eyes become vacant and staring, and the countenance often indicates fear. It is impossible for the patient to remain quiet; the movements are noticeably quick; speech is incoherent; the mind wanders; the beggar in his imagination becomes wealthy, and the millionaire, a tramp; wild and ferocious animals, and the most loathsome reptiles in turn creep over his body, or crouch ready to spring upon him; friends, long since dead, cluster around the bedside to upbraid him. At first the patient may appreciate the unreality of what he sees and hears, but in a short time they become real, and nothing can make it seem otherwise. Patients in this stage should not be left alone for a moment, as they not infrequently leap from windows or balconies, and are greatly injured, if not killed. They sometimes escape, imagining their attendants are their greatest enemies. Dr. Flint tells of a patient who escaped

in his night clothes and ran barefooted over frozen ground fifteen miles before being overtaken by men on horseback. The writer learned his anatomy of the bones, from a portion of a skeleton of a poor unfortunate, who escaped from the watchers to a neighboring swamp, while suffering from this affection. The body was not found till nearly a year afterward; word was sent to the friends who refused to care for it, and the authorities turned it over for the above useful purpose. Two students have since used it for a similar purpose, and it is now doing duty in a Michigan high school. Certainly this was better than confining it to the potter's field.

Causes.—These are so well-known it is hardly necessary to repeat them. The continued use of alcoholic stimulants gives rise to the disease. No doubt the attack is hastened in many cases by the withdrawal of the habitual amount; this accounts for the frequent occurrence of the disease in inebriates who are thrown into prisons or hospitals.

Treatment.—Upon appearance of the first symptoms, the following should be taken:

Mosquera's beef meal one tablespoonful, red pepper (capsicum) ten grains, mix and pour over it one-half teacupful of boiling water; as soon as cool enough, this should be taken at one draught, and repeated every three hours. If symptoms do not improve under this treatment and sleep ensue, take No. 90 every three hours, alternately with the beef.

No. 90.

℞

Sodium Bromid	ʒ v.
Chloral Hydrat	ʒ ijss.
Syrup Chocolate *Syrup Acaciae* *Elixir Simp*	aa. fl. ℥ ij.
Aqua dist. q. s. ad	fl. ℥ viij.

M. Sig.—ʒ iv every three hours as directed.

The object of No. 90 is to produce sleep, which is above all things most necessary in *delirium tremens;* with it comes relief, without it the symptoms described continue and multiply until death closes the scene. First and second attacks of the affection do not, as a rule, prove fatal; after this number the danger rapidly increases with each succeeding attack.

HYDROPHOBIA. (*Rabies.*)

"The affection called *rabies*, and more commonly known as *hydrophobia*, is due to the action of a special poison, a virus, generally derived from the mouth of some animal of the canine or feline race, viz., the dog, cat, fox or wolf." (Flint.)

It is not our intention to enter into a description or treatment of this disease. It has been demonstrated that the poison can be counteracted by inoculation, and as this is the only treatment which offers anything like a reasonable hope for the patient suffering from this disease, we advise that it be resorted to.

Hospitals are now established in nearly all cities for the treatment of these cases. It is known as the Pasteur Method, having been first successfully used by Prof. Pasteur of Paris. If bitten by an animal supposed to be "mad," do not, as is often done, kill the animal immediately, but secure it where it can do no further harm, and wait until the character of the disease is established. Dogs and cats often have epilepsy or other diseases that cause convulsions. Rabies in a dog is to be suspected when the animal shows symptoms of disease by eating straw, paper, etc., and refusing his usual food. He is usually shy and irritable. After the disease is well established, there will be little trouble in deciding whether the dog is mad or not; the ears and tail drop, the eyes are watery, saliva runs from the mouth, the bark is very noticeably changed. As the disease advances, the dog

becomes delirious, and snaps at invisible objects, or at anything that comes in his way.

Convulsions are not always present. The prevailing idea that a dog, when mad, will not touch water is incorrect; it is frequently lapped without difficulty. During the summer months, dogs should have an abundance of water, and always kept muzzled. Dogs die with rabies usually previous to the sixth day.

ST. VITUS' DANCE. (*Chorea.*)

This disease is characterized by irregular contractions of the voluntary muscles. The irregular, "jerky" movement usually begins in one or both of the arms, and gradually extends to the muscles of the face, and frequently to the lower extremities. It is sometimes difficult to realize that the patient is not making the movements purposely. The condition, however, in severe cases is truly pitiful; the patient is unable to walk, feed himself, or perform the voluntary acts which the wants of the body require; speech may be impaired or lost. These movements are usually suspended during sleep. There is no fever in this affection; the appetite is impaired, and the bowels constipated. The c is usually great irritability of temper.

Causes.—This disorder seems depend nt upon several causes. Notably among them are anæmia, rheumatism, malaria, worms in the intestinal tract, fright. It occurs mostly between ten and fifteen years of age, and much oftener in girls than boys. The affection continues from a few weeks to several months. The tendency of the disease is toward health.

Treatment.—If the patient is pale, ind cating anæmia the remedies prescribed under that disease should be given. If there are worms in the intestinal tract, the following, No. 91, will be found very effective in removing them:

No. 91.

℞

Gourd Seed	ʒ ss.
Sugar	ʒ v.
Milk	fl. ʒ ij.

M. Triturate the seed with the sugar, adding a few drops of milk from time to time until a paste is formed; add the balance of the milk, rub up well and filter. Take at one dose early in the morning, and two hours later give a dose of castor oil.—*Dupont Med. World.*

After this take No. 92, in teaspoonful doses, for four to six weeks, three times a day before or after meals as preferred.

No. 92.

℞

Hematic Hypophosphites (*P. D. & Co.*). fl. ʒ iv.

Sig —ʒ j three times a day as directed.

Care should be taken that any constipation is corrected.

APOPLEXY.

Apoplexy means literally "to cripple by a stroke," hence the incorrectness of the tautological phrase, *an apoplectic stroke*, so generally used to denote an attack of this disease.

The term apoplexy is commonly used to denote sudden loss of consciousness, sensation, and power of voluntary motion, together with more or less disturbances of the functions of respiration and circulation.

Symptoms.—As a rule, the attack comes on suddenly; the patient, without warning, falls down insensible, and paralyzed; the skin is covered with cold perspiration; the face is livid, the pupils dilated, the breathing laborious; this condition may terminate in death in a few minutes. These are the symptoms accompanying the worst cases. A less severe form is indicated by acute pain in the head, vomiting, and faintness, with pallor of the countenance; sometimes the patient only staggers, and does not fall; the consciousness is only temporarily lost,

and the patient appears better, though the headache continues—to be followed in a few hours by "coma," and paralysis of some part of the body.

"Coma" may continue for a few hours or days, and then pass off, the patient so far recovering as to be around; or it may continue, becoming more pronounced, and after a variable period of time death occurs. If the patient survives a first attack, the paralysis may pass off, or it may continue for an indefinite period, in some instances becoming permanent. The mental faculties are more or less affected by an attack of apoplexy, depending upon the amount of injury to the brain.

Another form, not so common as the preceding one, is the occurrence of paralysis without loss of consciousness. Apoplexy very often occurs in the night, the patient waking in the morning to find himself paralyzed.

Causes.—Apoplexy is due to pressure upon the brain. This is most frequently caused from hemorrhage within the cranium, and of course involves the rupture of the coats of a bloodvessel. The amount of blood which thus escapes differs much in different cases, varying from a few drops to several ounces. The severity of the attack, other things being equal, depends up n the amount of blood which escapes. Apoplexy is sometimes caused by congestion, and in such instances is preceded by symptoms which point to it, viz.: Impaired memory, a sense of fullness in the head, double vision, dizziness, disturbed hearing, numbness and pricking sensation in the extremities. The prevailing idea is that persons of full habit with shortness of neck, are more liable to attacks of apoplexy than those of spare or ordinary habit. The record of a large number of cases by different medical authorities proves the incorrectness of this opinion.

Treatment.—A physician should be sent for at once, and until he arrives the patient should be placed in a cool room; the head and shoulders moderately raised; cold

should be applied to the head, and heat to the extremities; everything which tends to constrict the neck or chest should be removed, and a clyster of soap and water should be given.

During the course of the disease, if it becomes necessary to give something to quiet the patient, dissolve fifteen grains of chloral hydrate in half a teacup of warm milk, and inject into the rectum.

Apoplexy arising from congestion does not prove fatal usually; arising from hemorrhage, the result is quite otherwise. If the first attack does not prove fatal, others are liable to recur sooner or later, which terminate unfavorably.

SUNSTROKE. (*Insolation.*)

The term sunstroke is applied to an affection occasioned by great heat. The name would indicate that it was always due to the sun's rays. This, however, is not correct, as it is sometimes caused by extreme heat, though the patient be excluded from the sun's rays altogether.

Symptoms.—The attack usually commences with pain in the head; a sense of fullness in the region of the stomach; nausea, and sometimes vomiting; dizziness and blurring of the sight, all objects becoming of the same color. These symptoms are rapidly followed by insensibility, and in about one-half the cases, convulsions.

The thermometer will indicate a temperature ranging from 103 degrees to 107 degrees. Frequent desire to void urine, with slight alternating sensations of cold and heat, are the symptoms pointing to danger of an attack.

Treatment.—This should consist of the application of cold to the head, neck and body. A bag of pounded ice should be placed to the head immediately. While this is being made ready hold a large piece to the head, and sponge the face, neck and chest with ice water. If ice is not at hand, pour cold water upon the head and over the

face and chest. Bear in mind that time is precious. As an internal remedy give No. 93 in tablespoonful doses every two hours:

No. 93

℞

Potassæ Bromid.	ʒ vss.
Aquæ	fl. ℥ viij.

M. Sig.—ʒ iv every two hours as directed.

As soon as the patient recovers consciousness, the dose of the above can be reduced one-half. If the patient cannot swallow, this should be given by the rectum, increasing the dose to a tablespoonful and a half, and adding an equal amount of warm water. After consciousness is restored, No. 93 in teaspoonful doses should be continued for a week, four times a day. The patient should remain quiet in as cool a place as possible, and dismiss all business or other cares. The diet should be nourishing, and sleep sufficient and regular.

The prevention of sunstroke is of great importance, and we believe, in the ordinary occupations of life, it can be accomplished by proper precautions. If you wish to escape sunstroke, don't drink alcoholic stimulants of any kind. Ninety-nine per cent. of the cases of sunstroke occur in individuals addicted to this habit. Don't drink ice water; it interferes with digestion, and thus lowers vitality. Don't expose yourself to extremes of heat if at all indisposed. Don't wear a heavy, ill-ventilated hat. Don't fail to get at least seven hours' sleep out of the twenty-four. Don't wear more clothing than is necessary. Don't eat meats or other heat-producing food. Don't fail to eat plenty of fruit. Don't get excited. *Keep cool.*

MENINGITIS.

By referring to Part First, a description will be found of the membranes of the brain and spinal cord, three in number, and named from without inward as, the *dura*

mater, arachnoid and *pia mater.* Inflammation of these membranes is termed meningitis. If the inflammation is confined to the portion within the skull, it is called *cerebral meningitis;* if to the spinal portion, *spinal meningitis;* when both portions are affected at the same time, it is called *cerebro-spinal meningitis.*

The last rarely occurs excepting in epidemic form, and as such has sometimes been called *spotted fever.*

HYDROCEPHALUS.

By this is meant the accumulation of water within the cranium. It is sometimes present at birth, or it may occur in early infancy, leading in some cases to enormous enlargement of the cranium, and giving rise to a characteristic deformity known as water-head.

PALSY. (*Paralysis.*)

Denotes loss in part or whole of muscular action or sensation; the former is termed motor paralysis, the latter sensory paralysis. Either may exist separately, or the two conjointly.

Paralysis is said to be *complete* when there is total loss of motion or sensation; incomplete when there is diminution only. It is *general* when the whole body is affected; *partial* when limited to a portion of the same. When both sides of the body are affected, it is called *paraplegia;* when only one, *hemiplegia;* local paralysis is meant when only a small portion of the body is affected, as the face, a foot, a hand, etc.

Paralysis, occurring in any of the forms as described above, is dependent upon some diseased condition of either brain or spinal cord, giving rise to an interrupted nerve supply. To illustrate: If a cord were tied tightly around the sciatic nerve (see engraving No. 18), the portion of the leg depending upon this particular branch for its nerve supply, would be paralyzed.

The same effects follow division of the nerve obstruction from the pressure of a tumor, or disorganization from disease of the nerve. The same will occur in any portion of the body, provided the nerves distributed to such portion are similarly affected. So complete obstruction at any point of the spinal cord, cuts off sensation and voluntary motion in all parts supplied by the nerves connected with the cord below the point of obstruction. In hanging, the spinal cord is broken high up in the neck and the nerve supply to the vital organs, as well as the body, is cut off, and heart and lungs cease to act—death being almost instantaneous.

The nerves of special sense are also liable to be affected, producing loss of sight, taste, smell or hearing; depending, of course, upon the nerve diseased.

VERTIGO.

This term is used to indicate a disorder which occurs in persons of apparently good health, and consists of giddiness suddenly developed. Surrounding objects appear to be turning round, or the person seems himself to be in rapid rotary movement; the patient attacked may fall, but usually staggers and saves himself by grasping some object. Accompanying the giddiness is usually more or less nausea, sometimes vomiting. These attacks vary in duration and frequency of occurrence. Vertigo leads to no serious disease, nor is it a forerunner of such; consequently no apprehension need be felt from an attack. Usually the stomach or bowels are at fault, requiring a few doses of prescription No. 56 (*cascara cordial*) to regulate them. Vertigo sometimes occurs from long continued mental effort; in such cases, a vacation is the best treatment.

LOCKJAW. (*Tetanus.*)

Lockjaw is characterized by persistent rigidity of the muscles of the jaw, and frequently the voluntary muscles

of the entire body. The persisting rigidity of the jaw has given rise to the name as above. The disease usually follows after wounds or local injuries of other kinds. It is an extremely rare affection, and we need not consider it further.

HYSTERIA.

This is a nervous affection occurring almost entirely in women. The emotional or reflex excitability is greatly exaggerated, with diminished will power, so the patient loses control over the emotions. "A person, whether male or female, is said to be hysterical, who weeps or laughs irrepressibly on inadequate occasions, and when the emotional acts are incongruous. Weeping and laughing are physiological acts when they represent emotions which are natural; that is, excited by adequate causes, and not exceeding the bounds which observation shows to be consistent with health. These acts are pathological when they do not represent corresponding emotions, or when they proceed from emotions which are unnatural in view of the circumstances under which they occur." (Flint).

Immoderate laughing and crying are not the only symptoms pointing to this affection. The morbid condition of the mind often leads to exaggeration of the symptoms, and to efforts at deception. To puzzle the doctor seems to be a *desideratum* with many hysterical patients.

Other symptoms of this disease, are a feeling in the throat as if it contained a foreign body, called the *globus hystericus*, and has the appearance of rising from the stomach, which has led to the belief in many instances, that the malady was due to the stomach containing a living reptile, which crawled up into the throat and caused the convulsion. If the reader will remember the actions of the gastric juice upon animal tissue, he will see how absurd such suppositions are. If a snake or other living animal, were introduced into the stomach, it would be

digested in a few hours at the longest. Yawning, stretching, sighing, twitching of the muscles, cramps, are also symptoms entering into many cases.

After one or two attacks, in which more or less of the symptoms as described above, are present, convulsions may occur. These are preceded by distress in the epigastrium; twitching of the upper eyelids and eyeballs, and excessive winking. The movements in convulsions of hysteria are distinctive of the affection; the limbs are thrown in various directions, often striking against solid objects with force; the patient rolls from side to side of the bed, and on the floor if not restrained, and sometimes shows a prodigious degree of strength. In this form of convulsions it is extremely rare for the tongue to be bitten, or foamy saliva to be ejected from the mouth, as in epilepsy.

These movements continue for a few minutes, followed by a period of rest, and are then renewed. Between the active movement the muscles often remain rigid; consciousness seems to be lost, but generally the patient has cognizance of what is said and done.

Causes.—Occurring in women, as it almost always does (some writers say there is no exception to the rule), it is presumable that the cause has its origin in the organs peculiar to their sex; and it is without doubt seated in the ovaries. In two cases which the writer saw in male patients, who had all the symptoms of hysteria, and were relieved by the usual remedies for the disease, investigation revealed the fact that both were in the habit of practicing self-pollution. This would seem to indicate that the sexual organs were involved in the causation. Overtasking of mind and body, mental anxiety or grief and the prostration incident to various diseases, tend to induce an attack of hysteria in persons prone to the disease.

Treatment.—First attacks usually alarm the friends,

and a physician is called. If he is honest, and tells the friends that the patient has hysteria, in all probability he gets his discharge, and another is called, who, being more discreet than honest, gives the disease a high sounding name, and after a variable period, the patient recovers, to the great satisfaction of the friends. The first called has a clear conscience, the last a larger bank account, and an increased—but fraudulent—reputation.

At the beginning of the attack, it is advisable to exclude all visitors, aud the patient should be told what the probable disease is, and encouraged to make an effort to control the symptoms. To aid in this give two grains asafœtida pills and repeat every two hours till the symptoms are relieved. If the bowels are constipated, they should be evacuated by means of a clyster; mustard should be applied over the ovaries. In case of convulsions, do not restrain the patient more than to prevent actual injury. The nurse should take care of the patient, and *all others* should be excluded from the sick room. Do not allow neighbors or friends to crowd into the room, or about the door. There is no danger in this affection. The attitude of the attendant toward the patient should be one of kindness but unswerving firmness. We think if this treatment is begun early, you will have no occasion to call a physician, but if you do and he informs you the affection is hysteria, do not feel offended, but thank him for his candor; follow his directions, and rest assured he will do you good; we feel positive of this, for moral courage and intelligence go together, and none but a morally courageous man would inform the friends or patient of the presence of hysteria.

EPILEPSY.

"The leading symptoms are usually sudden loss of consciousness and sensibility, with clonic spasms of the voluntary muscles, followed by exhaustion and coma; the

attack varying in intensity and duration, and having a tendency to recur at intervals. The paroxysmal loss of consciousness is, however, the prominent or important element present in every instance, while not infrequently it is the only one, there being no evident spasmodic movements of any kind. There are sometimes, though not in the majority of cases, premonitory symptoms sufficient to warn the patient of an approaching seizure. These warnings differ both in character and the length of time they last. In some cases they are too short to allow the sufferer to dismount from horseback, or to get away from the fire, or even to lie down; while in other instances many minutes, or even hours elapse, between their occurrence and the attack. Spectral illusions, headache, sickness, dimness of vision, tremor or twitching, confusion of thought, a vague sense of fear and terror, and especially that peculiar blowing sensation known as the *aura epileptica*, constitute the most frequent premonitory symptoms. The epileptic aura is differently compared by patients to a stream of cold water, or a current of cold or warm air, or the creeping of an insect, the sensation commencing at the extremity of a limb, and more or less rapidly ascending along the skin toward the head. Directly the aura stops the paroxysm takes place.

"*Symptoms.*—The commencement of a typical seizure is generally characterized by a cadaverous pallor of the countenance, and the utterance of a loud piercing shriek, or a kind of suppressed groan, immediately after which the individual falls to the ground senseless, and violently convulsed. Hence the disease has been called by the vulgar the *falling sickness*, or more vaguely *fits*. During the attack the convulsive movements continue violent. There is gnashing of the teeth, foaming at the mouth, and the tongue is thrust forward and often severely bitten; the eyes are partly opened and suffused, the eyeballs roling, and the pupils dilated and insensible to light; the

pulse becomes feeble, or it may remain natural, and the skin is generally cold and clammy. There may be involuntary defecation and micturition, with or without vomiting; the breathing is laborious or almost suspended, while the face gets flushed and then livid and turgid. In fact, death seems about to take place from suffocation; when gradually these alarming phenomena subside, the extremities of one side are jerked about, and shortly after all convulsive movements cease.

"The paroxysm leaves the epileptic insensible and apparently in a sound sleep, from which he recovers exhausted and with a slight mental confusion or headache, but without any knowledge of what he has just gone through. An attack of vomiting will sometimes follow the attack, while generally there is a copious secretion of almost colorless urine, of low specific gravity, for many hours after the fit.

"The average duration of the fit is three or five or eight minutes. It may, however, last for half an hour or more. The periods at which the seizures recur are variable." (Tanner.)

Causes.—The cause of this disease is very obscure. In about one-third of the cases it has an hereditary origin. If the mother is epileptic, the offspring is more likely to be so than when the father is afflicted. In many cases a history of some previous injury to the brain exists. Violent mental emotions, sudden fear, the sight of an epileptic fit, are exciting causes.

Treatment.—Bromine in the form of either *bromide of potassium or sodium* is perhaps the best remedy known at the present time for this affection. Most of the advertised "cures" are solutions of these medicines slightly colored. The following formula will be found a good one for the administration of this remedy:

No. 94.

℞

Potassa Bromid.	ʒ iiss.
Tinct. Gent.	fl. ʒ ij.
Aqua dist. q. s. ad	" ʒ viij.

M. Sig.—ʒiv as directed.

Take of the above a tablespoonful twice a day for ten days; then four times a day for a like period, and then increase to six times a day, and continue for thirty days. At the expiration of this time substitute *bromide of sodium* for the *potassium*, and commence with the same dose as at first, and increase in like manner, and continue for a like period. Do not attempt to hold a patient with an epileptic fit, only to the extent of preventing injury, nor should his thumbs be forcibly unclinched. Many people believe the attack will subside if this can be done. There is nothing in it. The patient will feel better after the attack, if allowed to struggle through it unmolested. A cork or piece of rubber can be placed between the teeth to protect the tongue. This will have to be done at the beginning of the attack.

NERVOUS HEADACHE.

Nervous headache, next to sick headache, is the most common of all forms of this disorder. It is not confined to any particular class of society, but is most frequently seen in persons of nervous temperament, and delicate organization.

No temperament can, however, claim exemption from it, and no habit of body is proof against it. In the majority of patients suffering from this form of headache, more or less anæmia exists. (See Anæmia.) It is properly the headache of exhaustion and overwork. Thus we see it occurring in women who are approaching the middle period of life, and who are exhausted by the strain of maternal duties; and in business and professional men,

who devote long hours to mental work, without any or very little physical exercise, and in those who think almost constantly upon one subject. It is now universally admitted that thought exhausts the nervous substance, as surely as walking exhausts the muscles; nothing, however, so rapidly exhausts the brain as monotony of thought or study.

Symptoms.—In the majority of cases, the attack begins with some disturbance of vision, such as a painful sensation on attempting to read or look at objects, and a misty or cloudy appearance before the eyes, flashes of light, dazzling sparks, etc. It is preceded usually with some excitement of manner and irritability, which varies from a few hours to several days.

The pain usually commences in the forehead and top of head, occasionally the back of it. After a little time it not infrequently seizes upon one temple or one eye, or one-half of the head; there is usually some disturbance of the stomach, but not to so great an extent as in sick headache. The attack varies in duration and intensity, sometimes lasting a few hours to as many days. In some cases the pain only partially interferes with the usual occupation, and in others prostrates the patient from one to three days, the pain being so intense as to be almost unbearable.

Treatment.—No rule can be laid down which will meet the indications in all cases. A change of occupation, scene and habits, will, in a large number of instances, lessen the frequency of the attacks. This is easily prescribed in headache, as in many other diseases, but unfortunately, the circumstances of life seldom admit of its being observed faithfully or conscientiously. A man is obliged to live in a large town, and from bad air and want of exercise he gets severe headaches; and if he resides in the country, he loses them. But he has no choice of residence; his lot has fallen among the noise and crowd,

where all is hurry and excitement, and he is driven forward with the throng, as feeble to oppose it as the stream of a gentle rivulet is to reverse the course of the mountain torrent into which it falls. When nervous headache is threatening, the patient should lie down, and observe the strictest seclusion and rest; this, if done at an early stage, will often avert an attack altogether. A small mustard plaster may be placed upon the nape of the neck. No. 95, taken as soon as symptoms are first felt, will often give relief.

No. 95.

℞

Acid hydrobromic (Wade's Formula) .....
Fl. Ex. Guaranae ..... } aa. fl. ʒ ss.

M. Sig.—ʒj in a half tumblerful of water. To be repeated as required.
—*Coll. and Clin. Record*

Another excellent remedy for this form of headache is

No. 96.

℞

Caffeine .....
Salicylate of Sodium ..... } aa. grs iv.
Hydrochlorate of Cocaine ..... " jss.
Syrup ..... fl. ʒ vj.
Aqua ..... " ʒ ij.

M. Sig.:—Take one half at the beginning of attack, and balance in 30 to 40 minutes.
—*Dujardin-Beaumetz.*

Another remedy of unusual merit is

No. 97.

℞

Citrate of Caffeine ..... grs. iss.
Phenacetine ..... " ij.
Sugar of Milk ..... " iv.

M. Sig.—Take at one dose.—*La Medicine Moderne.*

This last prescription can be repeated in two hours if necessary. It is also an excellent remedy for sick head-

ache, and if used for that affection, should be taken in the same dose as directed for nervous headache. Patients who are able to foretell an attack some little time previous to the pain in the head, will be able to ward it off by the following, by Dr. Wm. Henry Day of London:

No. 98.

℞

Potass. Bromid.	ʒ ij.
Spts. Am. Arom	fl. ʒ iij.
Aquæ Camph	" ʒ vj.

M. Sig.—ʒ iv three times a day.—"*Dr. Day*," *London.*

Persons who find it inconvenient to take internal remedies, will get much benefit from rubbing the following, liniment No. 59, upon the nape of the neck and temples. It can be used in any form of headache with advantage. Hygienic measures must not be neglected, but everything that tends to tone up the system must be resorted to; nutritious diet, regular and sufficient sleep, exercise in the open air, bathing, etc.

HYPOCHONDRIASIS.

This is a mental disorder in which the patients are greatly depressed in reference to the state of their own health. They are constantly fearing either the existence of, or liability to, some serious malady.

The mental suffering arising from these errors of belief often exceeds those which would ensue did the fancied disease actually exist. The disease is not confined to the uneducated, but is as liable to attack the intelligent as otherwise. Dr. Flint says on this point: "It is a noteworthy fact, that hypochondriasis is not confined to the weak-minded. Persons of education and strong mental powers, are as liable to the affection as those who are ignorant, and of feeble intellectual capacity."

It is not uncommon for hypochondriacs to successively complain of suffering from various maladies, as consump-

tion, cancer, diabetes, etc.; these imaginary ills are sufficient in many instances to keep the patient in bed.

One doctor after another is called, but none of them, to use a common expression with these patients, seem "to hit the case." If these patients have a large bank account, they are not only bread and butter for the traveling doctor and advertising specialist, but "honey" as well.

Causes.—This disease is no doubt due to defective nutrition of the brain, but just how the conditions leading to it are produced is not at present understood. Debilitating influence, such as onanism and sexual excess, want of fresh air, and digestive disorder, give rise to hypochondriasis. Persons who have led active lives, and suddenly relinquished them for the opposite, are very liable to this disorder. Business failure, disappointment in the pursuits of life, and severe affliction of any kind, enter into the causations in many instances.

Treatment.—If the patient recognizes the existence of this malady, it is a near approach to cure. This, however, will seldom occur. It will be the friends that will notice its presence. Do not leave the patient to be victimized by unscrupulous charlatans, but seek treatment from an honorable practitioner; one who makes mental and nervous maladies a study, will be preferable. Remember that this is as truly a disease as any other in the list, and should be so treated.

INSOMNIA.

Inability to sleep becomes at times a most trying and serious affection with individuals who consider themselves otherwise well. In a common form of this complaint, the patient retires, and instead of going to sleep, almost immediately finds himself reviewing the day's business cares, or planning for the future; and in spite of every effort to rid the brain of these thoughts, and secure "Sleep, that sometimes shuts up sorrow's eye," wakeful-

ness continues long into the night or early morning, when a few hours' rest are obtained. This continues night after night, unfitting the patient for business, and making life anything but enjoyable.

In another form of this complaint, when the patients have once awakened, even though they have slept but a few minutes or hours, they find it utterly impossible to go to sleep again.

To a third class belong those patients who are able to sleep well upon retiring, but who wake up at an unreasonably early hour, and after that there is no sleep for them for the rest of the night.

The first class includes cases occurring mostly in business and professional men, teachers, and those who have long hours of mental labor, without sufficient out-of-door exercise. During sleep the amount of blood within the cranium is very greatly lessened. This physiological fact indicates the treatment, namely, lessen the amount of blood in the brain. A sponge wet with cold water and bound upon the nape of the neck, close up to the hair, will often act like a charm. Rubbing the feet and lower extremities with a coarse towel or flesh brush will relieve many cases. Those who dine early or lightly will find a glass of milk with a piece of stale bread an excellent remedy, to be taken just before retiring. College students, who pursue their reading far into the night, often find they cannot sleep upon retiring. The bread and milk as above will be all that is required, in connection with the wet sponge, in the large majority of such cases.

As bedtime approaches, endeavor to break the chain of thought by reading or conversing upon a different subject from that which has engaged the mind during the day. Many people fail to win the fickle goddess by being too anxious. A determination on the part of the patient to go to sleep often thwarts the object desired.

At the hour of retiring, it is much better that the mind be engaged with some subject other than sleep.

Medicine should not be resorted to for relieving wakefulness, except in extreme cases. The following No. 99 will be found an excellent and safe remedy, but should not be used a great number of nights in succession :

No. 99.

℞

Chloral Hydrat	grs. XL.
Potass. Bromide	" XL.
Syrup Acac.	fl. ʒ ss.
Syrup Chocolate	" ʒ j.
Elix. Simp.	" ʒ ss.

M. Sig.—ʒiv fifteen minutes before getting into bed.

Many cases of insomnia will be materially benefited by the administration of two grains of quinine three times a day for ten days. This is especially true of cases occurring as described under forms two and three above. Insomnia, following prostrating diseases, will require remedies to tone and strengthen the system.

NEURALGIA.

Pain, varying in character and intensity, occurring along the course of a sensory nerve, is termed neuralgia. The pain is peculiar, usually occurring in paroxysms, or if continued, it is more severe at certain periods than others. It is described by different patients as darting, lacerating, or tearing. Neuralgia is often named from the nerve affected, as *trifacial neuralgia*, sciatic neuralgia, etc. The *trifacial nerve* (fifth pair) makes its exit from within the skull, just in front of the ear, divides into three branches, and is distributed: First, to the forehead, eyelids, and side of the nose; second, to the temple, cheek, and upper teeth; third, to the lower teeth, and

integument of the chin and lower jaw. Any one of these branches may be affected, or all, and constitutes trifacial neuralgia. This is one of the most common forms of the disease. The pain is intense.

Causes.—Trifacial neuralgia occurs much oftener in males than in females, and usually between the ages of twenty and forty. Anæmia, a decayed tooth, straining of the eyes, malaria, and syphilis are all active causes.

Treatment.—If the attack occurs at about the same time every day, the treatment will be three grains of quinine every three hours for three or four days, then three times a day for a week, and follow this with No. 100 known as the Hammond mixture.

No. 100.

℞

Strychniae Sulph. (cryst.)	gr. j.
Ferri Pyrophosphates	aa. ʒ j.
Quiniae Sulph	
Acid phosphor. dil	aa. ʒ ij.
Syr. Zingiberis	

M. Sig.—ʒ j three times a day.

As an external application, use No. 59, rubbing it in thoroughly in front of the ear and over the course of the nerve. No. 101 will be found an excellent pill for most any form of neuralgia of the head, face or neck:

No. 101.

℞

Iodidi Arsenic	gr. j.
Ext. Belladonnae	aa. grs. viij.
Valerianate Morph	
Pulv. Ext. Gent. (P. D. & Co.)	grs. v.
Fl. Ext. Aconite Root (P. D. & Co.)	gtts. v.

Ft. pill. mass et div. into LX pills. Sig.—A pill one to three times in twenty-four hours.

These pills should be taken, one to three times in twenty-four hours as required.

For controlling the pain of neuralgia, we know of

nothing better than the following No. 102 which may be given every one to three or five hours; many cases being entirely cured by its use.

No. 102.

℞

Phenacetine	3 jss.
Caffeine	grs. xv.
Pulv. Ext. Cannab. Ind. (P. D. & Co.)	aa. grs. ijss.
Pulv. Ext. Aconite (P. D. & Co.)	
Hyoscin. hydrobrom	gr. $\frac{1}{6}$

M. Capsules No. xv. Sig.—One as directed every one to three to five hours.

Where anæmia exists, the remedies prescribed for that disease should be used in connection with some of the above. If caused by bad teeth, they should be treated; it is not always necessary to have them removed.

SCIATIC NEURALGIA.

Sciatic neuralgia, improperly called sciatic rheumatism, is neuralgia of the sciatic nerve (see engraving No. 18, Part I, page 145).

The affection is characterized by paroxysmal pain extending along this nerve and its branches. The pain is usually intense; sometimes described as burning, and sometimes as a sensation of coldness.

Symptoms.—If the pressure be made over the course of the nerve, tender points will be discovered. Movements of the affected limbs increase the pain, in some cases to such an extent, that the patient remains in bed, keeping the limbs as immovable as possible. In mild cases, the patient is able to walk about, experiencing pain only when the weight of the body falls upon the affected limb. In some cases, from disuse the muscles of the diseased limb become flaccid and diminished in size, but regain their natural conditions as soon as the pain subsides and movements be resumed.

Treatment.—The hot air or water bath, twice or three times a week—depending upon the strength of the patient—in connection with the application of blisters as directed for muscular rheumatism, will relieve most cases. The bath should be given hot enough to cause a free perspiration; the patient being kept warm for some little time after, and thoroughly rubbed dry.

As an internal remedy, take No. 100 three times a day till two bottlefuls have been taken, then twice a day for ten days.

CONVULSIONS IN CHILDREN.

There is, perhaps, nothing in the list of diseases to which children are subjected, which so greatly appals the nurse and parents, as convulsions. Many diseases which in adults begin with a chill, commence in children with a convulsion. Amongst these are, scarlet fever, measles, small-pox, pneumonia. The most frequent cases, however, occur from irritation of some portion of the intestinal tract, as in teething, intestinal worms, and indigestible articles of diet. The symptoms pointing to a probable attack are, restlessness during sleep for a day or two; the eyes are partly open during sleep; there is more or less grating of the teeth, with sudden starting if touched; the child is cross, and changes color often. Children are more liable to convulsions during the period previous to, and during the first dentition. The convulsions resemble those of epilepsy, and may continue from one-fourth to an hour. A long-drawn, deep inspiration indicates the termination of the spasm, and if the child sleeps naturally for some time after this, he will not be as likely to have a return as if the sleep is broken, accompanied by twitching of the limbs.

Treatment.—This is a condition that the mother or nurse can treat about as well as a medical man.

We advise as the first thing, to give an enema of warm

water, to which has been added a little salt or vinegar. While this is being done, some water should be made hot, and a cotton sheet wrung from it, and wrapped next to the child's skin, and outside of this, wrap a woolen blanket. Apply cold to the head in the form of pounded ice, or cold compresses; plain mustard drafts upon the nape of the neck and calves of the legs. If the bowels do not move in a little time, the enema should be repeated; the object being to get a free evacuation. Continue the cold to the head, and change the sheet every half hour for a couple of hours, and then wipe the skin dry and put on warmed clothing. As soon as the child is able to take medicine give No. 103 every fifteen minutes, in teaspoonful doses.

No. 103.

℞

Potass. Brom	grs. xvj.
Aqua	fl. ʒ iv

M. Sig.—ʒ every fifteen minutes as directed.

The dose of No. 103 is for a child from eight to twenty-four months old. Previous to eight months give one-half teaspoonful. If the child has fever, in addition to the above treatment, put five drops of tincture of aconite into a glass of water, and give teaspoonful doses every fifteen minutes, alternating with No. 103. In children subject to convulsions, No. 103 can be given as a preventive whenever it is deemed necessary. It should be given every half hour, or hour, or at longer intervals, according to the severity of the symptoms.

STAMMERING AND STUTTERING.

In reference to the above terms which are usually—though incorrectly—used as synonyms, we copy from the *British Medical Journal* some remarks by Dr. J. D'Orsey:

1. "Speech, or articulated voice, depends for its perfect

production on vigor of mind, and on due training of the vocal or articulating apparatus.

2. "Stammering is inability to articulate, marked by slowness, stoppage, hesitation and indistinctness, but not with repetition; whereas, stuttering consists in a painful repetition of the same consonants, often attended by flushing and facial contortions.

3. "Stammering and stuttering may sometimes be caused by organic defects, such as cleft palate, harelip, enlarged uvula, inflamed tonsils, etc.; but these impediments are far more frequently due to functional causes, that is, habit, imitation, heredity, etc. Nervousness is often the consequence or concomitant of stammering, rather than its cause. Organic defects must, of course, be treated surgically, but the subsequent cure belongs to the elocutionist, while functional derangements (wrong action of the voice apparatus) are peculiarly his province.

4. "The sooner the curative process begins, the greater is the prospect of success. What is easily eradicated at an early age becomes hard to remove at a later period; though at any time of life alleviation, if not cure can be assured as a result of perseverance. "He will grow out of it," is a fatal saying. A fair time ought to be given, according to the nature of the case; for "a few lessons" cannot reasonably be expected to undo the mischief of many years; and the teacher is often accused of failure, when the blame is solely attributable to the patient or the parent."

CHAPTER XII.

GENERAL DISEASES.

ACUTE ARTICULAR RHEUMATISM.

Properly, this form of rheumatism should be classed amongst the blood disorders; the morbid elements giving rise to pain and swelling of the joints being contained in that fluid.

Symptoms.—The disease usually begins suddenly with chilly sensations, followed by slight febrile action, headache, and general ill-feeling. In from six to forty-eight hours, pain more or less severe attended with swelling, commences in one or more of the joints; the knees, ankles and wrists are the ones most likely to be attacked first, and the rule is that the joint on each side is affected, that is both knees, both ankles, etc. There are exceptions to this rule. In addition to the pain and swelling, there is great tenderness and increased heat and redness of the skin in the vicinity of the joints involved. Pain is produced by movements of the affected joints. In severe cases the slightest motion is insupportable; even jarring the bed or room occasions suffering. It is not an uncommon thing for the disease to abruptly disappear from one or more joints, and within a few hours make its appearance just as abruptly in another. Occasionally the affection is limited to a single joint for a greater or less period.

The temperature in acute rheumatism will vary from 102 degrees to 107 degrees; pulse is increased in frequency, though not greatly. The appetite is lost; tongue

coated; the bowels are constipated; the urine diminished and dark in color. A reddish deposit is usually noticed if the urine is allowed to stand until cool. There is sweating, which is increased during the night and the sweat emits a sour odor.

Causes.—In the majority of cases, the patients attribute the attack to action of cold or exposure.

The disease does not, however, arise from such causes. In some families there is a predisposition to the affection, and there is no doubt as to the hereditary transmission of the disease. An attack is rare before the age of five years or after fifty; the majority of cases occur between fifteen and thirty years of age. The disease occurs at all seasons of the year, and in all climates. Malaria is often an important factor entering into the causation.

Treatment.—The patient should be put in bed and kept warm. The following capsules, No. 104, given one every hour until a free action of the bowels is produced.

No. 104.

℞

Hydrarg. Chlor. Mite	grs. v.
Sodae Bicarb	" xx.
Sugar of Milk	" xx.

M. et div. put into capsules No. xx. Sig.—One capsule every hour as directed.

As soon as the bowels act give of No. 105, two teaspoonfuls at a time, three hours apart.

No. 105.

℞

Olei Gaultheri	♏ clx.
Mucilag. Acac	fl. ʒ ij.
Glycerina	aa. fl. ʒ j.
Aquae	

M. Sig.—ʒ ij every three hours.

As an application to the affected joints, take equal parts of oil of wintergreen and olive oil, shake well together

and apply every three hours, gently but thoroughly rubbing the parts for fifteen minutes. If any medicine is required to allay pain, give from three to five grains of Dover's powder as required. The patient can be allowed to drink as much water as he may wish.

Lemonade, not very sweet, can be given freely; the diet should be light for the first week, and afterward more nourishing. The average duration of the disease is about three weeks. It seldom proves fatal, except when the pericardium is involved, and this is not frequent.

DIPHTHERIA.

"Diphtheria is a specific communicable disease, occurring epidemically, endemically and solitarily, and characterized by more or less inflammation of the mucous membrane of the pharynx, larynx or air passages, and by the formation on the surface of those parts—especially on the mucous membrane of the fauces and windpipe—of a layer or layers of lymph or false membrane." (Mackenzie.)

Symptoms.—These vary in different cases, fron a slight sore throat to the most serious and malignant blood poisoning; between these two extremes we meet with every gradation of intensity. The period of incubation is from two to five days, in which there is general ill-feeling. In children this is not easily noticed, and the first that attracts attention is the indications of a chill, which is rapidly followed by fever. The thermometer in the axilla will show a temperature from 101 to 103 degrees.

If the child be observed closely, there will be signs indicating stiffness of the neck, with *slight* difficulty in swallowing. If the throat be examined it will be found swollen and red; in a few hours a viscid, yellowish secretion will be seen accumulating in the depression of one or both tonsils; after a few hours longer these patches enlarge and change to a grayish-white, and in severe cases run together, forming a continuous membrane over the

tonsils and throat generally. This membrane is sometimes so thick as to resemble wash leather, and can be removed in strips.

In this stage the parotid, sub-maxillary and lymphatic glands enlarge and become tender. Care should be taken to examine the neck at the back, about half way between the ear and median line, to see if any "kernels" can be found. If present they furnish pretty good evidence that the disease is diphtheria, as they do not appear in the sore throat accompanying scarlet fever or tonsillitis. The temperature at this stage of the disease will be somewhat less, as a rule, than at the beginning. The breath is usually offensive; the appetite is lost; the urine is scanty and highly colored; the pulse is frequent and weak. At the end of seven or eight days these symptoms begin to abate, if the disease terminates favorably. Care must be exercised, however, as there is danger of a relapse.

If the disease is progressing, the symptoms as given above continue, the membrane extends to the posterior nares, larynx and Eustachian tubes, the patient may either sink from *secondary* blood-poisoning, with typhoid symptoms, or gradually deepening coma. Cardiac embolism is often formed in this affection, causing death. In extremely malignant cases, death sometimes occurs within forty-eight hours from the first symptoms, which may be a convulsion.

Causes.—Diphtheria is due to *bacteria* which may be taken into the system either by direct inoculation through the air, or through the water or milk (see Consumption) that is drank, or the food that is eaten. The bacteria of diphtheria may be carried from one locality to another by a person not affected by it. The infection, however, is not carried through the atmosphere to so great a distance as small-pox. A distance of thirty feet is sufficient to preclude all danger of the disease being contracted. The disease attacks persons of all ages, but is most frequent

between the ages of one and ten years. After the latter the liability to an attack and the danger therefrom is diminished in proportion as the age increases.

Treatment.—This should be left in the hands of the family physician. The patient should be excluded from other members of the family by being put into a large, cheerful and well ventilated room; the air be kept warm and moist; a temperature of 60 to 65 degrees should be maintained day and night. A nutritious diet is of greatest importance. Mosquera's beef-meal tea, beef jelly, milk, eggs, etc., are appropriate.

MEASLES. (*Rubeola.*)

Measles belong to a class of diseases known as *eruptive fevers.* These are characterized by fever attended with an eruption. In this class belong *small-pox, scarlet fever, chicken-pox, rose rash* and *German measles.*

These fevers are divided into stages occurring in the following order: *Incubation, invasion, eruption* and *desquamation.* By the stage of incubation is meant the period elapsing between the time of exposure and the beginning of the disease; by invasion, from the time of the first symptom to the appearance of the rash; the stage of eruption includes the time intervening between the first appearance of the rash and its beginning to fade; and desquamation, from the ending of the stage of eruption until convalescence is established. The different stages vary in each disease, and we advise the reader to study the table given on page 414. Measles is an infectious disease occurring epidemically.

Symptoms.—In from six to ten days after exposure, the disease commences with symptoms resembling a cold. There is coryza and frequent sneezing, and a watery discharge from the nostrils. The eyes are reddened and watery, and there is intolerance of light; more or less cough is present; chilly sensations are felt; the appetite

is impaired or lost, and sometimes nausea and vomiting occur; pain in the head and limbs, with lassitude, are complained of. This is the stage of invasion, and usually lasts about four days, when the eruption appears, first upon the temple and forehead; in a few hours it extends to the head and neck, and in a day or two to the body and extremities. This stage (eruptive) occupies thirty-six to forty-eight hours. The rash at first appears in the form of minute red dots or specks, slightly elevated, which soon enlarge, and tend to arrange themselves in circular or crescentic form. The papule resembles flea-bites, and enlarges, uniting to form blotches. During this stage the symptoms denoting coryza and bronchitis continue. The temperature at the beginning of the stage of eruption may reach as high as 103 to 105 degrees, but diminishes rapidly after about the second day. The tongue is coated, the throat slightly reddened, but not sore. About the fourth day from the first appearance the rash begins to fade, and in two to four days more is gone.

Causes.—Measles is no doubt caused by a vegetable germ hitherto spoken of as *infectious miasm* which may be transmitted through the medium of the atmosphere. The infection may be carried in the clothing. The disease occurs at all periods of life, but the liability diminishes after fifteen years of age. The disease, as a rule, increases in severity after the period of youth is passed.

Treatment.—In the majority of cases, hygienic measures only are necessary. The patient should be put in a well-ventilated room, at a temperature that insures comfort; the room should be moderately darkened. Drinks may be given, either warm or cold, and whichever is preferred should be strictly adhered to; it is not advisable to alternate from cold to warm, or *vice versa*. A sponge bath given daily, at the temperature of 80° to 90°, the feet being placed in water somewhat warmer, will help to preserve the functions of the skin, and add much to the

comfort of the patient. Do not give cathartic medicine in measles. If it is known that a child has been exposed to the disease, it will be good treatment to give a *compound cathartic pill*, and follow it with a grain of quinine four times a day for a few days, but during the course of the disease use either an enema or suppository to move the bowels. (See directions for nursing).

The following, No. 106, given in teaspoonful doses every four hours from the start until convalescence is established, will allay the cough and help to bring out the rash:

No. 106.

℞

Pulv. Ipecac et Opii..... grs. x.
Syrup Simp.....
Aqua dist..... } aa. fl. ʒ ij.

Sig —ʒ j every four hours as directed.

No. 106 is for a child from six to eight years of age; from eight to twelve the dose can be increased by one-fourth if required; below six it should be diminished in like ratio; at the age of 1 to 3, one-fourth to one-half of a teaspoonful will be sufficient.

The disease extends from twelve to sixteen days. Any complication, such as pneumonia, will require the attendance of the family physician.

SCARLET FEVER. (*Scarlatina*).

Scarlet fever is so named from the color of the eruption. Like measles, it is essentially a disease of childhood, but is more to be dreaded. There is no known affection presenting such diversity as regards symptoms and fatality, as this. In its mildest form it is a trivial disorder; in its severest, it is appropriately styled malignant. However widely different cases may appear in respect to symptoms and gravity, they are essentially identical.

The stage of incubation in scarlatina, is from one to six days.

Symptoms.—The affection may commence with or without a chill, vomiting is an early and frequent symptom, and high fever; severe cases show a temperature of 103° to 105°. Bleeding at the nose is not uncommon; there is redness of the throat in this stage (invasion) and sometimes soreness.

In about twenty-four hours the eruption makes its appearance generally, first upon the neck and face, and rapidly spreads, covering more or less of the entire body in twenty-four hours. Redness is most vivid, and remains longest in situations where the skin is delicate, as the inner surface of the arms and thighs and joints. The redness, if closely examined will be found to be studded by little points. The redness disappears if a hard substance—as a pencil—be drawn across it, leaving a white line, which soon fades. There is burning and itching. The eruption reaches its greatest intensity on the third day from its commencement. The eruption is likely to be less in proportion as the throat affection is greater. The tongue is coated from the beginning, but often in this stage it becomes thinner, and the swollen papillæ raised and red like a strawberry. This is known as "the strawberry tongue," and is seen in no other disease. During the stage of eruption, the fever continues, and may reach to 105° or 107°. The pulse is very frequent and quick, often reaching 120 to 150; anything less than the former would be considered favorable. The bowels are usually constipated; the urine scanty and high-colored.

The eruption continues from four to six days, and when it begins to fade, the stage of desquamation may be said to have commenced. This stage continues from six to twelve days, and sometimes longer. The cuticle peels off either in the form of minute branny scales, or in pieces

of epidermis of greater or less size. As desquamation begins, the fever subsides. Itching is sometimes intense during this stage. Occasionally a recurrence of the rash takes place during desquamation.

Causes.—Like diphtheria and measles, scarlet fever depends for its origin upon the introduction into the body of bacteria. This may take place either by the lungs or stomach. The germs retain their vitality for an indefinite time, and may be transmitted by means of the atmosphere, or by clothing, hair, beard, etc.

An example showing the remarkable vitality of the germs of this disease, at one time came under the writer's notice: A lady was called a distance of over two hundred miles to help care for a sister's child, sick with malignant scarlet fever. Soon after her return, children of her own had the disease, but in a very mild form. They were allowed (not by the writer's consent) to return to the public school during the stage of desquamation, and several cases resulted from this inadvertency, one of which proved fatal. These cases occurred early in March. The following October the writer was called to attend a little girl, and diagnosed *scarlet fever*. Upon investigating the origin of it, found that the doll of the patient had been loaned to the little girl who died during the spring epidemic; she had been allowed to have it in bed with her, and after her death it had been returned and placed away in the garret, where it remained till a few days previous to the commencement of the disease. Here in one instance the germs was carried over two hundred miles, and in the other lay dormant in the clothing of the doll for over six months. No stronger proof is necessary of the transmissibility of the disease than the above, nor more conclusive reasons for thoroughly disinfecting every article which has been near a patient suffering from this affection.

Treatment.—Scarlet fever, like the others of its class,

runs a definite course, and there are no known remedies by which it can be arrested or controlled.

Mild cases require little in addition to free ventilation, cooling drink, and light nourishment. Perhaps the most important point in treatment, either of mild or severe cases, is that pertaining toward preserving the functions of the skin. The complication, or sequel, most likely to occur is dropsy, which depends upon the kidneys performing their office. If the skin is kept acting, these organs are less likely to become affected, hence, the importance of maintaining the functions of the skin.

For this purpose there is nothing better than the tepid bath given two or three times in twenty-four hours. If this is not at hand, the sponge bath should be used, and repeated several times during the day, or a wet sheet may be used wrung from water at the temperature of about 90 degrees. Exposure to cold must be avoided, but fresh air must not be excluded from the patient's room.

The patient should be closely watched, and if there is any swelling of the face beneath the lower lids, or of the ankles, the hot air bath should be resorted to at once, and continued until free perspiration is produced.

For sore throat of scarlet fever, we know of nothing better than No. 40, applied as described under Quinsy, page 300.

To reduce the fever, give No. 107, a teaspoonful every hour until three doses have been taken, and then wait six to eight hours, and again give as at first.

No. 107.

℞

Antipyrine ..... grs. xvj.
Fl. Ext. Lily of the Valley ..... gtts. x.
(P. D. & Co.)
Syrup Simp. q. s. ad ..... fl. ℥ ij.

M. Sig.—℥ j as directed.

No. 107 is for a child five to eight years old; from one to four, one-half the amount can be given; from nine to twelve, it can be increased by one-quarter.

The temperature should be taken at the time of beginning to give the remedy, and noticed from hour to hour to see how much the fever is reduced; the nearer the temperature comes to normal the better, and the remedy should not be given until it begins to rise again.

As a remedy for preventing scarlet fever, No. 108 will, we believe, be more efficacious than any other; and at least seven out of ten of those exposed will be prevented from having it, and the other cases will be very much lessened in severity if it be given promptly, a teaspoonful four times a day for two days, and then three times a day for a like period, and then twice a day until three or four days after the time for the disease to commence.

No. 108.

℞

Acid Salicylic..... grs. xl viij.
Aqua dist..... } aa. ℥ j.
Glycerina..... }

M. Stand in the hot bath until the acid is all dissolved. Sig.—℥ j as directed.

No. 108 is intended for a child five to seven years old. For a child eight to twelve, increase by one-quarter; from one to three, give one-third the amount named in prescription; three to five, two-thirds. If a child is attacked with scarlet fever, it should be at once excluded from all others, and any child who may have been exposed should be given the above as directed. To allay the itching of scarlet fever, the surface of the body may be rubbed with cosmoline or vaseline; this is better than the old-fashioned bacon rind.

SMALL-POX. (*Variola.*)

This disease is of so infrequent occurrence, that we shall only give an outline of it without entering into the

details. The stage of incubation is longer than the other fevers of this class, being from ten to fourteen days.

The stage of invasion is usually two days, the disease commencing with a chill, which in most cases is marked. This is followed by fever, nausea and vomiting; the tongue is coated; the bowels constipated; headache, pain in the limbs and back and general debility are prominent symptoms. The pain in the back is usually great. On the third day the eruption begins to appear, as a rule. If it appears later, mildness of the disease may be expected.

Stage of Eruption.—The eruption appears first on the face about the lips and chin, and nearly at the same time upon the wrist and neck, and next upon the chest and arms; then over the body, and lastly the lower extremities. The eruption is at first in small red spots, which harden and become elevated. In twenty-four hours from their first appearance, they will be found filled with a watery fluid, and in twenty-four hours more they will have enlarged to considerable size, and by the fifth day will measure from one-fifth to two-thirds of an inch in diameter, and are raised to nearly one-quarter inch above the skin. At this stage of the eruption, a slight depression will be noticed in the center of the vesicle. This characteristic is peculiar to the eruption of small-pox. The sixth day the eruption changes; the watery fluid becomes thick, yellowish, having more of the characteristics of pus. At the beginning of the eruption the fever very much abates, as does the pain in the head, loins, limbs, etc. At the time the eruption changes to pustules—fifth to seventh day—the fever returns and continues three to four days; at about the twelfth day the swelling and redness of the skin begins to lessen; the pustules break and form a scab. During this stage (dessiccation) the skin exhales a sickening odor, which is characteristic of the disease, and once met with will always after be recognized.

Treatment.—"Prevention is better than cure." See that you are revaccinated every seven to ten years.

CHICKEN-POX. (*Varicella.*)

This is a disease of children. After fever of a few hours, or not more than twenty-four, the eruption of varicella appears, often on the back first of all as distinct, red papulæ, which become vesicular in a few hours; the eruption is successive during three or four days. The same kind of changes in the eruption occur as in small-pox, but the disease is more superficial, and the vesicle is unilocular; it is not umbilicated; the contents are serus. On the first day the vesicles are transparent, opalescent on the second and third day, on the fourth they shrink and dessiccate, and on the sixth the scabs fall off. The general symptoms are slight, and there is no secondary fever.

Treatment.—This should consist simply of hygienic measures.

VARIOLOID.

By varioloid is meant small-pox occurring in a patient who has been previously vaccinated or inoculated. Inoculation was practiced for many years in France and Great Britain as a means of rendering this disease so mild as to be nearly devoid of danger. This custom was introduced from China, where it has been practiced from time immemorial.

The discovery by Jenner, in 1798, that small-pox was very much modified, and in a majority of cases prevented, by vaccination, has entirely done away with inoculation. Edward Jenner's transcendently important discovery has been the means of saving innumerable lives and untold and immeasurable suffering.

Between the second and third month of infancy every child should be successfully vaccinated with *animal lymph*, and revaccination should be practiced every seven to ten years.

If this were thoroughly practiced by every parent and individual, it would in time put an end to continuously

returning small-pox epidemics. A successful vaccination will present the following changes: On the third day after vaccination red points slightly raised are noticed at the location where the virus was inserted; on the fifth day vesicles are discernible, and by the eighth day the full size is attained, measuring about one-third of an inch across, and about the ninth to tenth day the contents become purulent. At this time slight febrile movement occurs, which subsides in two or three days. By the fifteenth day the pustules are converted into a hard black scab, which usually falls off by the twenty-fifth day from date of vaccination.

TABLE SHOWING THE DISTINGUISHING FEATURES OF ERUPTIVE FEVERS.

NAME.	PERIOD OF INCUBATION.	DAY OF RASH.	CHARACTER OF RASH.	DURATION OF ILLNESS.	REMARKS.
Measles.	6 to 10 days.	4th day of fever.	Small red dots like flea bites.	6 to 10 days.	Accompanied with cough and running at eyes and nose.
German measles	12 to 20 days.	1st to 2d day.	Like measles with a tendency to spread.	5 to 10 days.	Sore throat, but not so severe as in scarlet fever.
Scarlet fever.	1 to 6 days.	1st to 2d day.	Bright scarlet, and spreads rapidly.	8 to 15 days.	Very infectious, often accompanied by sore throat, followed by falling off of the skin
Small-pox.	12 days.	3d day.	Small red pimples, which fill with water and afterward with pus.	17 to 24 days.	Great pain in back and head: about eleventh day secondary fever sets in
Chicken-pox.	21 days.	10 to 24 hours.	Small rose red; becoming vesicles.	6 to 7 days.	Not serious, but apt to leave scars.

FEVER.

The term fever is used to denote a diseased condition of the system, shown by increased temperature of the body, acceleration of the pulse, and a general derangement of the functions, including, usually, more or less headache, thirst, impaired appetite, pain in the loins and limbs, lassitude, muscular debility, restlessness, imperfect sleep, and diminished secretions; in short, in the language of Fordyce, "A fever is a disease which affects the whole system."

Fevers are called *continued* when they pursue their course without any well-marked remissions. In *remittent* fevers certain intervals occur daily in the course of the disease, in which intervals there is no cessation of the fever, but simply an abatement or diminution. The remissions usually occur toward the morning, and continue for six, ten, twelve or fourteen hours. They are followed generally by increased feverish excitement or exacerbation toward night, continuing for some hours. In *remittent* fevers there is an interval of almost perfect health. The three common species of intermittent fevers or ague are the quotidian, tertian and quartan. When the paroxysm occurs at the same hour every day, it is called quotidian ague; when every other day, tertian, though secundam would be more appropriate; and when it is absent for two whole days and then recurs, quartan. In the first species the interval is twenty-four hours, in the second forty-eight, in the third seventy-two. The time between the commencement of one paroxysm and the beginning of the next is termed the interval; that between the termination of one paroxysm and the commencement of the next, intermission.

In *relapsing* fevers, during convalescence, the disease, which appears to have gone, returns. Fevers of unusually long duration are called *slow;* if attended by great depression, *low;* when the symptoms are intense, the fever is said to be *high.*

Symptomatic fever is one indicating some other diseases, such as wounds, injuries, inflammations, etc., and is mostly a symptom, as indicated by the term.

An *essential fever* is one that is not dependent upon any other disease, hence is the primary affection.

MALARIA.

The term malaria is used to denote the presence of germs in the atmosphere, which when introduced within

the human body give rise to a series of morbid symptoms that are produced by no other known causes. These germs thrive best in low and moist localities; require a temperature above 60° Fahr. for their development, and are checked by a temperature of 32° Fahr.

Malaria is the cause of the class of fevers known as *periodical*. They are also known as *malarial fevers*, and include *remittent* and *intermittent*. Remittent fever is also known as bilious fever. Intermittent fever is popularly known as "fever and ague," "chill fever," "the shakes," "chills," "swamp fever," etc. The different types of this affection have already been defined. The attack is divided into three stages, viz.: Cold, hot, and sweating stage. These stages may all vary in duration and intensity; the first and third may be absent.

Treatment.—The bowels should be first freely moved by taking from one to three *compound cathartic pills*, following this with two to three grains of quinine every three hours day and night, stopping for neither chill, fever nor anything else. Three to six days of this usually controls the worst cases. The quinine should be continued for a week or ten days after the fever is "broken," but need not be taken more than four times in twenty-four hours. In some localities,—as the South and Southwest—it may be necessary for more active measures, and for this we advise No. 104, taking one capsule every hour till a free movement of the bowels is produced, then take

No. 109.

℞

Quiniae Sulph	grs. c.
Oleum Piper. nig	gtts. L.
Oleum Sassafras	" L.
Acid Arsenious	grs. iv.
Strych. Sulph. (*cryst.*)	" ij.

M. Ft. pil. No. L. Sig.—One pill at meal time.—"*Dr. Watkins*," *Med. Summary.*

and after it is gone take quinine four times a day, two to four grain doses.

Many people say they cannot take quinine on account of its making their bones "ache." To such we wish to say, it is not the quinine that causes the "aching," but the disease, malaria. The writer has known scores of people to say that they could not take quinine for various reasons, but when it was colored with some inert drug, and given under the name of "fever powder," to take it for days in succession with impunity.

The treatment for remittent fever is the same as given for intermittent.

BREAKBONE FEVER. (*Dengue*).

This fever occurs in the Southern and Southwestern States. The symptoms are chilly sensations, languor, general ill-feeling, for twenty-four to forty-eight hours, when fever begins; and continues for twelve hours to three or four days. During the time of fever there is great pain in the head, eyes, muscles of the neck, loins, and extremities; hence the name, *breakbone fever*.

In the majority of cases, there is an eruption which has no definite form. The disease is liable to return, and run a second course even after the patient has resumed his usual avocation. This affection, although extremely distressing, is rarely, if ever, fatal.

Treatment.— Dover's powders in three to seven grain doses every four hours may be taken to alleviate the pain and restlessness. During convalescence, remedies to tone up the system should be taken. No. 11 can be used for this.

TYPHOID FEVER.

Typhoid literally means typhus like, or we might say, a fever like typhus. It is also called *continued* fever. The peculiarity of this fever is, that it is always attended with morbid changes in Peyer's patches and the solitary glands

(See Part I, page 112), these special lesions are always present.

Symptoms.—As a rule, typhoid fever is developed gradually, the patient often experiencing difficulty in fixing the commencement of the attack.

There is usually chilly sensations, frontal headache, pain in the back and limbs, loss of appetite, broken sleep, lassitude, nosebleed, and looseness of the bowels. These symptoms usually increase in severity till the patient feels obliged to take to the bed. Looseness of the bowels and nosebleed are the symptoms of the greatest importance. These two in addition to a temperature in the axilla in the morning of 100° to 101°, which increases during the day so the evening temperature is 102° to 103°, are pretty strong evidence of the presence of this affection.

During the first few days after the patient takes to the bed, the above symptoms continue, or may increase in severity; the face will likely be flushed, and wakefulness is complained of. Thirst is a prominent symptom in this stage of the disease. After about the first week in bed, it is not uncommon for the patient to complain of nothing, sleeping most of the time, the countenance becoming extremely inexpressive. Delirium is present in the majority of cases, and is always increased during the night. It may exist only during this period. In some cases the patient appears perfectly rational, but after recovering is unable to remember anything that occurred during his illness. *Coma* coming on during the second or third week, is an unfavorable symptom.

The tongue in typhoid fever is distinctive only in its varying appearance. It may be simply furred, or it may be covered with a thick brown coating, or even black, or the coating may be whitish or yellowish, or the tongue may be free of either fur or coating, presenting a red, shining appearance. Diarrhœa or looseness of the bowels usually continues through the entire course of the disease.

There is usually tenderness in the right iliac region. The abdomen is almost invariably distended. Hæmorrhage from the bowels occurs in a certain proportion of cases, but unless profuse, is not a serious symptom. The hæmorrhage is caused by the ulceration in the intestines; this is sometimes so deep that the coat of the intestines is destroyed, allowing its contents to escape into the peritoneal cavity, causing peritonitis. This accident is known as perforation of the bowel.

Typhoid fever is accompanied in nearly all instances with an eruption, rose colored, and found principally on the anterior portion of the body. The papules are about the size of lentils. They number from a half dozen to twenty-five or thirty, and appear between the seventh and fourteenth days. There is more or less perspiration. The pulse in this disease is more or less accelerated, the danger, as a rule, being in proportion to the acceleration; 120 per minute is a dangerous point, and the gravity greatly increases as the frequency exceeds this number; 90 to 110 per minute would be considered a favorable number for this affection. The temperature in typhoid fever is a valuable guide, both as to diagnosis and prognosis. There is always an increase in the temperature from morning till evening, this increase varying from one to two and a half degrees; thus a temperature at 6 A. M. of 100 degrees would mean 101 degrees to 102.5 at 6 P. M. If 102 or 103 in the morning, an increase of one to two and a half degrees is certain to follow. This daily increase in temperature is characteristic of this disease, and in taking the temperature, one morning should be compared with another. The same is true as regards evening temperature. If there is no increase from morning to morning, the disease, it may safely be said, is doing well. If an increase is observed, the disease is progressing, while on the other hand, any decrease, however slight, is favorable. A temperature of 104 degrees to 106 degrees, may be

present in the evening without denoting positive danger. This temperature, however, in the morning would indicate great gravity, the latter figure approaching dissolution.

The urine is high colored and scanty. It is voided in many cases with difficulty, owing to the blunted perception; on the other hand, it is not uncommon for the urine to be passed in the bed, either from indifference or incontinence. The duration of this affection varies from seven to forty-two days, the average being twenty-one days; this includes the time previous to taking to the bed.

Typhoid fever runs in periods of seven days. Allowing that the average time of taking to the bed is the fifth day, the average duration of the disease would be sixteen days from time of taking to the bed. This would mean until improvement began. The average duration of fatal cases will be from one to three days longer. This disease is one of those which are very rarely experienced twice, one attack usually preventing a second.

Causes.—It is now well established that typhoid fever is caused by a specific poison in the form of a germ. These germs are elaborated within the intestinal canal of individuals sufferiug with this fever, are passed from the body with the dejections, and being transmitted to those who are susceptible, give rise to the disease. Typhoid germs produce typhoid fever with as much certainty when brought under proper conditions, as corn produces corn, or potatoes produce their kind. There is little doubt that these germs may be carried for a limited distance through the air, and in this way get into the alimentary canal. Drinking water, however, is the chief medium of transmission. The terrible epidemic which occurred in Plymouth, Pa., during April and May, 1885, affords the most positive proof of this, and also the *urgent necessity for popular education in reference to the cause and prevention of disease. In this instance, the ignorant disposal of the excreta of one patient gave rise to over twelve hundred*

cases, and upward of one hundred and thirty deaths. Drs. French and Shakespeare of Philadelphia, investigated this epidemic, and from their report we make the following extract:

"Now, let us turn to the facts concerning the contamination of that mountain stream. It may be well, however, to state here that it has been shown that the three lower reservoirs on the mountain stream, which nine months of the year supply Plymouth with water, were on the 20th of March nearly empty; that in a dwelling on the sloping bank of the stream a little distance above the third reservoir, and within seventy feet of the bed of the brook, there was a case of typhoid fever, running its course through January, February and March; that during most of this period the ground was frozen and covered with snow; that during the illness of this patient the evacuations passed in the night were habitually carried out and thrown upon the snow toward the stream, *no attempt at disinfection having been made;* that about the 25th of March a thaw began, and was followed by slight rains; that on the 26th of March the superintendent of the Plymouth Water Company inspected the reservoirs, and finding the two upper ones full, that same evening caused the water of the third reservoir to be let down directly to the lowest reservoir; that on the evening of this day pumping from the Susquehanna River ceased, and the town was again entirely supplied from the mountain stream; that thus nearly three months' accumulation of infectious typhoid fever dejecta was suddenly washed with the melting snow into the brook, and rapidly reached the lower reservoir, and was thence distributed through the pipes and hydrants of the Plymouth Water Company; that fifteen days after this date the epidemic began; that no other source of unusual pollution of the mountain water was discovered.

"In the first two or three weeks of the epidemic, those who exclusively used well water and those who exclusively used river water escaped the infection. Of children living in houses supplied with well water, only those who attended the public schools and drank the hydrant water of the Plymouth Water Company took the disease, while those kept at home went unharmed. It was also noted that those who habitually used beverages other than water, were safe from the attack.

"On Welsh Hill, a suburb of the town having a population of four or five hundred, mainly supplied with well water, not one person has been sick of the fever, except a few who frequented the town, and drank of the hydrant water there.

"Epidemics of typhoid fever are a reproach to the communities which they afflict. They are absolutely preventable and controllable, and from the standpoint of modern experience, neglect to employ proper means to those ends should be regarded as inexcusable."

Typhoid fever is rare in infancy, or after the age of fifty years. It most frequently appears between the ages of fifteen and twenty-five. Both sexes are about equally liable to the disease. It occurs most frequently during the autumn, though it may occur at all seasons of the year

Treatment.—Typhoid fever is very likely to get well if the patient does not get too much medicine, and enough care and nourishment. It must be remembered that *there are no means of breaking the fever.** Some writer has likened the disease to a storm at sea; the storm cannot be stopped, but if the ship is seaworthy, and captain and pilot competent, the storm is usually weathered. Many persons, during the time previous to taking to the bed, very much injure their chance of recovery by taking large doses of cathartic medicine with a view to breaking the fever. This leaves the bowels in an irritated condition and increases the ulceration. No. 104 will be a most excellent remedy for putting the liver and bowels in condition to endure the inevitable attack, One capsule every hour should be taken until an evacuation is produced, and then discontinued. After this take one grain of quinine every four hours dissolved in a little water, and the following pill every four hours alternating with the quinine:

No. 110.

℞

Argenti Nitras (cryst.)..... grs. x.
Sugar of Milk..... ʒ j.
Tragacantha q. s. ad. pil. mass.

Divide into pil. No. lx. Sig.—One pill every four hours as directed.

*You should look with suspicion upon the doctor who claims to "break" typhoid fever, or who calls every minor ailment by this name. He must belong to one of two classes which we decline to name in this connection.

The temperature should be kept below 102° if possible by frequent sponge baths with water at a temperature of 70° to 90°; these may be given every hour if necessary. Bathing the surface with tepid water, and allowing it to dry without the use of the towel, is an effectual way of reducing temperature. Give the patient fresh air without limit; don't fear his taking cold. Make the room cheerful. Exclude visitors. Don't worry the patient with anything. When the patient begins to recover care should be exercised or he will over-eat. He will want to get out of bed and have his clothes on a week or ten days before he ought to.

The *disinfecting lotion* given in miscellaneous receipts should be kept standing in all vessels used to receive the evacuations from the bowels. Use enough of the lotion to cover the excreta; this will not only destroy the odor, but also the germs, and prevent the spread of the disease.

We have given our treatment for this disease for the benefit of those who are so located that it is not convenient to call a physician. When it is otherwise we advise that the case be put under the care of your family physician.

ASIATIC CHOLERA.

So little is known in this country, even amongst medical men, of *Asiatic cholera*, and in view of the fact that it may visit America at any time, we give in full an article written to the *Deutsche Medicinische Wochenschrift*, by Dr. Paul Sachse, Sanitary Councillor of Berlin. It should be well studied in time of cholera:

"Cholera is caused by infection with the microscopic organism called the coma bacillus on account of its peculiar form in cholera. These get into the human intestine, increase rapidly under favorable circumstances, and cause the peculiar symptoms of cholera. This begins always with an apparently harmless diarrhœa, which continues for several hours before the disease breaks out with force and becomes dangerous to life.

The possibility of infecting one's self in time of cholera with the bacillus is increased a thousand fold by assemblages and inter-communication of people. The outbreak of the disease is favorably influenced by everything that causes any stomach or intestinal affection.

Since we have no absolutely certain means of controlling the disease after it is broken out, we should especially beware of becoming infected, and should take all precautions to kill, or at least render as harmless as possible, the cholera germ before it gets into our bodies, and by a regular mode of living and prudent deportment, avoid anything that disorders the digestive apparatus.

Since the cholera germs get into the stomach through the mouth, and from the stomach into the intestines, we should take care:

1. To take only cooked food and drink. This is the most important rule. Even the washing, rinsing and bathing water should be free from germs, and the water from the wells should never be used, but only that from the city pipes.

2. To keep the body clean, and especially the hands, by frequent washing, especially before meals, and this should be done with disinfecting solutions, such as five per cent. solution of carbolic acid, (or a one-third per cent. solution of sublimate), and of this, in time of cholera, at least a quart should be used for washing the hands.

3. To live judiciously and carefully in time of cholera, and

(a) Not run away!

(b) Not to harbor people from cholera places.

(c) Not to visit a house in which there is cholera.

(d) Still less, eat or drink anything in such a house.

(e) Especially, to take nothing, food, linen, laundry, playthings, or anything else, from a house in which there is cholera.

(f) To avoid in every way anything that may disturb digestion; therefore:

Avoid taking cold, and sudden cooling off after being heated.

Do not sit up late at night with friends (drinking beer, for example).

Do not wear clothing that is very thin, and do not take off under clothing suddenly.

On no account bathe in running water. Water courses often bear the germs of cholera.

Avoid collections of people, fairs, festivals, etc., of every kind.

4. All kinds of food are to be avoided that may cause catarrh of the stomach and intestines; so also over-eating and over-drinking are to be avoided.

Every one should take the greatest precaution with regard to what comes into the house.

What may one eat and drink? What is forbidden? What is allowed?

FORBIDDEN.	ALLOWED.
Unboiled water.	Boiled water with cogniac, arrac, or red wine.
Raw milk and raw cream, and sour milk and whipped cream.	Good soda or seltzer water, and natural mineral waters.
Butter and buttermilk.	Red wine.
Freshly baked bread.	Good lager beer.
All cold soups.	Coffee, tea, and cocoa.
Raw meat.	Baked bread must be heated for at least half an hour before it is used.
Cold, cut meat that has stood for a long time.	All hot, well cooked soups.
Salads of every kind.	All hot (boiled, stewed, roast) meat.
Mayonnaise and Crêmes.	All cooked vegetables (potatoes, rice, maccaroni, asparagus, green peas, cauliflower, etc.,)
Raw fruit and unfermented fruit juices.	Freshly cooked, warm compotes.
Cheese.	Eggs, and food made of eggs.
Cookies.	Puddings.
Ice.	

Good Daily Diet.—Morning, 1st. Breakfast: Coffee, tea, or cocoa (with or without boiled milk), eggs, bread (that has been well-heated and dried in an oven or stove for half an hour—in other words, bread that has been cooked a second time) *without* butter.

2d. Breakfast: Bouillon with egg, bread as above, warm meat, wine.

Noon meal: Hot soup, boiled or stewed meat, roast meat, vegetables, fresh cooked compote, red wine or good beer.

Tea: Coffee or tea.

Supper: Tea, or soup made from the meat left over from the noon meal, with the morning's bread, or warm meat. Wine or beer as above.

5. Every irregularity of the body should be strictly guarded against in time of cholera. Apparently slight diarrhœa should not be neglected, but a physician should be consulted immediately."

In case of threatened invasion of cholera, these rules should be given the greatest possible publicity.

CHOLERA INFANTUM.

As the name implies, this is a disease peculiar to infancy, occurring under two years of age.

Symptoms.—The symptoms given by Dr. Flint are as follows:

"A child is seized with vomiting and purging, the latter usually occurring first; the acts of vomiting and purging are violent, and frequently repeated; after the contents of the stomach and bowels are expelled, the evacuations consist of secreted or transuded liquid in more or less abundance. The attack may cease or be arrested, and recovery speedily ensue, as in cases of the sporadic cholera of adults; but this favorable course does not obtain so generally in children as in adults. If the course be unfavorable, the vomiting and purging continue; the child is tormented with thirst, but everything is rejected from the stomach; great prostration ensues; collapse follows, and death takes place in one, two or three days. The fatal results may be preceded by convulsions and coma. In some cases the violent symptoms of cholera cease, and the attack eventuates in a chronic affection, accompanied by diarrhœa and occasional vomiting.

"In other cases the affection is gastro-intestinal indigestion. These are characterized by diarrhœa, the dejections being lienteric and watery. Vomiting occurs only occasionally, and is an accidental symptom. It may even not occur at all. The diarrhœa is more or less persisting, the discharges being often green in color, an appearance which Golding Bird, and, more recently, Dr. J. Lewis Smith, have shown not to depend on vitiated bile; the appetite is impaired or lost; colic pains are apt to be troublesome; the child progressively wastes, and death may take place from inanition."

Causes.—Late discoveries have shown that nearly all the stomach and bowel complaints of infants are due to poisonous substances developed in the food supplied to

artificially fed infants, and these poisonous substances are caused by atmospheric germs. High temperature and vitiated air are the conditions favorable for the development of bacteria, and when the latter gain access to the alimentary canal they interfere with normal digestion, and by their action cause acute poisoning. The watery movements from the bowel are the result of the effort on the part of the system to get rid of the poison, and little is to be gained by locking up these irritating products in the intestine. The rational treatment consists in removing the contaminated contents of the bowel, arresting the further development of bacteria, and securing a pure food supply for the future. It is clear, then, that with proper precautions regarding the purity of the food supplied for young infants, all these troubles may be avoided.

Treatment.—This should be left to the family physician, but much can be done to prevent an attack. If a child has to be artificially fed, care should be exercised that it has the purest of prepared food. During the warm weather, when this affction is most liable to be developed, endeavor to keep the little ones cool by proper clothing. Do not put them to bed *for a single night without a tepid bath.* This will reduce the temperature temporarily, and insure a night's good sleep. Much can be done to prevent this disease by a plentiful supply of pure cold water at all times, and on all occasions, night or day, whenever the little one desires it. And further, we would like to impress it upon the minds of all who have the care of children, to lay aside any scruples of reserve they have in regard to giving cold water, *and to give it freely.* Children not able to let their wants be known shonld have it placed to their lips, and be allowed to drink to their satisfaction.

CANCER. (*Carcinoma.*)

A *Cancer* is an ulcerating tumor of a malignant nature.

It may happen in almost any part of the body, and possesses the following peculiarities:

"1. It has the peculiar power of infiltrating every tissue as it encroaches upon it.

"2. It is prone to recur after removal.

"3. It generally affects the lymphatic glands of the neighborhood.

"4. It usually destroys by secondary deposits, that is to say, by the development of similar growths in the viscera or remote parts, the lungs and liver being particularly prone to its attack."

There are different kinds of cancers, the most common being the *hard* or *scirrhous carcinoma*. This class is the one usually found on female breasts. It is also seen in the testicles, tonsil, skin, bone, eye, rectum or any tissue.

The *soft* or *medullary cancer* possesses all the cancerous peculiarities. It is not distinct from the hard cancer, for both often co-exist, and the hardest primary cancer is often followed by the soft in its secondary growth. It is rarely found in the breast, but more frequently about the periosteum and the bones. It is the usual form in the eye, uterus, tonsil, testes and ovary. Also the cavities of the head and face appear to be particularly favorable places for its attack.

Another kind is the *black* or melanoid cancer, which contains pigment having its origin in a natural tissue, as in the choroid of the eye, or in a mole, in which pigment exists.

These black cancers have the peculiar tendency to multiply to such an extent that the skin and under skin tissues become studded with these *melanoid growths* of various sizes and colors.

These cancers always grow from places having much pigment, and a mole is unquestionably the commonest seat.

The *skin* or *epithelial* cancer is usually found in the

mucous membranes and the skin, and never originates in any other tissue, but has the tendency to infiltrate the parts with which they come in contact. This is the common form found in the lip, tongue, œsophagus, rectum, scrotum, penis, clitoris, mouth of the womb, vulva, etc.

Causes.—These are of the most obscure nature. Local injury is supposed to have a marked influence. That this malignant disease is in many cases due to *heredity* is perhaps beyond a doubt.

Cancer in the beginning is considered a local disease, but becomes general by disseminating its elements. If detected in its earliest growth, the surgeon may be able to extirpate it, and thus a respite may be secured.

Treatment.—All that can be done is to improve the general health, by nutrition of the body and hygienic means; good, nutritious diet, and such tonics as the family physician may deem best to prescribe, are essential.

There is so far no medicine in existence which possesses any curative qualities for cancer.

WORMS.

The intestinal worms of frequent occurrence in the human body are the round worm, *ascaris lumbricoides*, and seat or pin worm, *ascaris vermicularis*. The former inhabit the small intestines and may get into the stomach by the acts of vomiting; the latter are found in the large intestine, principally the rectum. The round worm varies in length from five to fifteen inches. It resembles the common earth worm. It is of a whitish-yellow color; the body is round and tapering toward each extremity. It is most common between the ages of three and twelve years of age, and it is extremely rare previous to two years, or past adult life.

Symptoms.—About the only reliable symptom of these worms is the presence of one or more in the stools. Colic

pains, impaired appetite, itching of the nose, offensive odor of the breath, disturbed, dreamy sleep, and grinding of the teeth during sleep, are symptoms usually ascribed to the presence of worms.

Worm fever is of extremely questionable existence. Children have fever and pass worms from the bowels during such attacks, which has given rise to the idea that the fever was caused by the presence of the worms; nothing, however, is more common than the passage of worms from the stomach or bowels when there has been no symptoms of any disorder.

Causes.—The ova from which the worms hatch, are introduced into the alimentary canal by means of water in which they are contained, and finding in the small intestines favorable conditions, the production of the worms takes place.

Treatment.—Let the patient have a light dinner and a still lighter supper, and at bedtime give one powder of No. 111, and at midnight give the other. If the bowels do not move freely by 7 A. M., give a dose of castor oil.

No. 111.

℞

Pulv. Santonin..... grs. ij.
Sugar of Milk..... " x.

M. et div. into pulv No. ij. Sig.—One powder as directed.

No. 111 is for a child from four to ten years of age. From two to four one-half a powder will be a dose, which should be given as described above.

Pin, or seat worms, as before stated, are chiefly found in the rectum, where they exist frequently in immense numbers. They are small in size, measuring from two to five lines in length. This form of worms occurs usually in children, but are not uncommon at all periods of life. They occasion pain in the rectum, tenesmus and itching at the anus. The itching is particularly troublesome at

night. By examination of the stools, it is easy to determine whether they are present or not.

Treatment.—Internal treatment is the same as for round worms, followed night and morning for ten days, with an anæma made from quassia chips, one ounce to a gallon of boiling water, and using about a teacupful of this at one time. It should be warmed, and injected well up into the bowels. For the itching and soreness around the anus, use either a little carbolized or camphorated oil.

TAPEWORMS. (*Tænia solium.*)

Tapeworm usually occurs singly, but not always so, as its name would imply. It exists in the small intestines, and it varies in length from five to ten or even thirty feet, and in breadth from one line—at its narrowest part—to four or five at its central or broadest portion. The head of this parasite is small and flattened, about the size of a pin's head, having in its center a projecting papilla or proboscis, and is *characteristically* armed with a double circle of hooks, about twenty-four or twenty-eight in all, around which are four suckers or discs. The worm, in consequence of the presence of hooks, is often described as the armed tapeworm. There is a neck joining head and body, and it is about half an inch long. The joints are capable of an independent existence when well formed. Their number is often from 800 to 1,200 in all, including perfect and imperfect.

Symptoms of its presence are not very striking, its existence being generally unsuspected until single joints are passed in the stools; in many cases, however, there is a continual craving for food, debility, pain in the stomach, emaciation, and itching about the nose and anus.

Treatment.—The patient should eat a light meal at noon, and go to bed without anything more for the day. At 7 A. M. the next morning take one-third of No. 112, at 9 A. M. the second third, at 11 A. M. the balance.

No. 112.

℞

Chloroform (best)..... fl. ʒ j.
Oleum Jiglii..... ♏ j.
Glycerina..... fl. ʒ x

M. Sig.— One third at a dose two hours apart.

CHAPTER XIII.

MISCELLANEOUS DISEASES.

DISEASES OF THE EYE

It is not within the province of this work to describe, and much less treat the many ailments which afflict the eyes, it being solely the business of an oculist. We shall, therefore, notice only such as can be treated without the aid of professional skill.

BLACK EYE.

This affection is usually caused by contusion and consequent rupture of the smaller bloodvessels in the eyelids and adjacent parts.

Treatment.—Take of prescription No. 113 and paint the bruised parts with it, using a camel's hair brush, being careful that no part of the mixture gets between the eyelids, and allow it to dry, a second or third coat being applied as soon as those previously made are dry.

No. 113.

℞

Tinct. Capsici..... 3 j.
Mucilage Gum Acaciae..... 3 j.
Glycerina ....gtts. x.

M. Sig.—Apply with a camel's hair brush as directed.

If this preparation is applied immediately after the injury is inflicted, the treatment will invariably prevent the blackening of the bruised parts.

The application of a fresh piece of lean beef or raw oyster to the injured parts is also good, and should be resorted to when the above prescribed remedy is not immediately obtainable.

No. 113 is also an excellent remedy against bruises, without abrasion of the skin of other parts of the body, and to prevent the formation of darkened spots or patches —usually spoken of as "black and blue spots."

STYE.

This affection occurs frequently in the earlier years of life. It is caused through the inflammation of the small glands in the lids, and comes to a suppurating point at the edges of the lid, forming small abscesses. It is not unusual that after one stye has healed another forms at the same place, or in close proximity.

Treatment.—As soon as the swelling is noticed on any part of the edges of the lid, procure from your druggist five cents worth of *compound tincture of iodine*, and a *small glass rod.* Dip the latter into the tincture of iodine, so that only a very small amount adheres to the rod, and touch the stye with the same, exercising the utmost care that none of the liquid gets into the eye. The application of this remedy will arrest the growth of the stye.

Care should be taken that the bowels are not constipated, and if they are, we advise taking a dose of *rochelle* or *epsom salts.* Washing of the affected eye with hot water is also recommended. It will have a tendency to soothe the sore places.

BLOODSHOT EYES.

This unsightly affection is usually caused by contracting a cold. It is not particularly painful, but if not cared for at the beginning, may lead to an inflammation. The habitual use of strong drinks gives the eyes an appearanec of being "bloodshot." In the latter case nature effects a cure, if the drinking habit is discontinued.

Treatment.—Keep in a room where the light is subdued, and apply to the eyes triple folds of clean cotton or linen cloth saturated in cold chamomile tea. If this is not obtainable, use common black tea instead. This disease looks more dangerous than it really is.

FOREIGN BODIES IN THE EYE.

This accident is of common occurrence, and causes considerable pain, and if the irritating substance which has lodged between the lid and eyeball is not speedily removed, inflammation or paralysis of the lid may be the consequence.

Treatment.—As soon as any object "gets into the eye," immediately begin to *rub the well eye.* Don't touch the other. If this does not succeed in removing the substance, turn back the lid and with the point of a cambric or silk handkerchief remove the object, if it can be seen; if not, take a small syringe and gently inject tepid water under the lid; this will wash out the foreign body. It often happens that the pain continues after the object is removed, the feeling being the same as if it were still beneath the lid. This is due to injury to the delicate membrane lining the eye. Cold water should be applied during the day to relieve this, and at night a tablespoonful of tea thoroughly wet with cold water should be put into a little bag, and lightly bound over the eye.

INFLAMMATION OF THE CONJUNCTIVA.

(*Conjunctivitis.*)

This affection is an inflammation of the mucous membrane of the eyelids. The symptoms of the disease are first manifested by a burning, and then pricking sensation in the eye. After this, discharge of mucus takes place; in aggravated cases pus forms, and is discharged. By turning the lids down, it will be noticed that the mucous membrane is very red, and dotted with little white nodules, called "granulations."

In this affection the eyeball also suffers, inasmuch as the glands of the inner lid, owing to their inflammation, do not give off sufficient fluid to properly moisten the eyeball.

Individuals suffering with this disease have a constant inclination to rub the eyelids; this is especially true of children. It should be avoided under all circumstances, as it heightens the inflammation.

Treatment.—The application of pure cold water should be first resorted to, as it will subdue the inflammation. Avoid, above all other things, smoke, dust and wind. Keep in a darkened room; do not use your eyes at all, and exercise care that no additional "cold" is contracted.

If the above treatment prove of no avail, we advise that an oculist be consulted, but should such practitioner be beyond reach, the following, No. 114, will prove to be an excellent wash for inflamed and granulated lids:

No. 114.

℞

Sulphate of Hydrast.	gr. j.
Aqua dist.	℥ j.

Make solution. Sig.—Apply as an eye wash.

In applying the above, No. 114, care should be exercised that the solution gets well into every part of the inner lids.

COLOR BLINDNESS.

This affection consists of the inability to distinguish colors. Thus, some take red and green for yellow, blue, black, white, or gray. Others again, take red for yellow or green, and still others cannot distinguish blue and yellow, and perceive these colors as red, green, or gray. This condition is due more to early impressions than any defect of the eye. If a child be told that the sky is green, and grass blue, he will so think, and it will be hard to change this impression in after life. A careful methodical training

in reference to colors during early life, will prevent this difficulty.

SQUINTING.

Squinting occurs in children about the time they begin learning to read. By a prompt adoption of the use of glasses most cases can be remedied. If squinting (strabismus) becomes permanent, an operation will be necessary. This is neither dangerous nor painful.

OVERFLOW OF TEARS.

Overflow of tears is caused by the *lachrymal canals* or *nasal duct* becoming obstructed. This is remedied by the surgeon removing the obstruction. It is sometimes necessary to introduce, permanently, a silver tube into the duct for the tears to pass through to the nose.

WILD HAIRS.

These are hairs which have grown on the inner side of the lid, and scratch against the eyeball. They should be extracted with forceps, and the lids thoroughly washed.

CATARACT.

This is a disease in which the crystalline lens or its capsule becomes opaque, thus interfering with vision. It can be removed by a skillful operator.

CARE OF THE EYES.

The care of the eyes is of utmost importance, as it is the principal agent through which intelligence is obtained. Every child, before being put to school, should be examined by a competent oculist to see that no defects of the eye exist, as many of the mental as well as bodily attributes of a growing child are influenced, if not created, by the condition of the eye alone.

The eye should be protected from sudden changes

between light and darkness. They should never be used by light so scant that an effort is required to discriminate. Never use the eyes at any close work while directly in front of a light. The best light is from above or obliquely over the left shoulder.

Too much light is as bad as too little. It is time to stop when an effort is required to distinguish. Glasses should be used as soon as there is the least indication that they are needed. Many minor non-inflammatory affections of the eye are benefited by bathing in water as hot as it can be borne.

The eyesight, as a rule, begins to fail about the fortieth year. Having to hold things at a distance, as in reading, is the first indication of it.

DISEASES OF THE EAR.

It would be impracticable to treat in a work of this kind the more complicated diseases of this important organ. They should only be attended by an experienced specialist. There are, however, several minor ailments and accidents to the organs of hearing which do not require the services of the *aurist*.

It is hoped that a few words about the care of the organs of hearing will be welcome, and those who follow them will surely appreciate the hints.

As described in Part I of this work (see page 183), a wax is secreted in the auditory canal, surely for a purpose. Many persons seem to think that this should be removed about as fast as it is secreted. This is an erroneous impression, and the wax should not be interfered with. It happens, however, that it occasionally hardens, causing, in consequence, an itching sensation. This is easily remedied by dropping into the auditory canal two or three drops of sweet oil, twice a day for a week.

FOREIGN BODIES IN THE EAR.

Insects sometimes enter the auditory canal, and are not easily dislodged. An effectual way of inducing these little pests to come out of the ear of their own accord, is to place the patient within a dark room, and then hold right in front of the ear a bright light. The insect will be attracted by it and leave the cavity. Should this, however, fail, take an ear syringe and inject tepid water into the cavity. This should be done gently.

Children often place kernels of corn, beans, peas, etc., in their ears. Through the moisture given off by the body these kernels swell, and if not attended to in time, serious results follow.

A doctor should be called to attend to this, and until he arrives the patient's head should be placed upon a pillow, the affected ear downward.

EARACHE.

For this very painful affection No. 115 will be found much superior to the old mixture of sweet oil and laudanum. Saturate a piece of cotton and introduce well into the ear. It should also be rubbed behind and in front of the ear:

No. 115.

℞

Camphorated Chloral ..... 3 ss.
Glycerina ..... fl. 3 iij.
Oil Sweet Almonds ..... " 3 j.

M. Sig.—Apply to ear as directed.

FOREIGN BODIES IN THE NOSE.

These can be removed with a pair of forceps, if you have them; if not, make a loop of clean smooth wire, and pass up and around the object and draw it down. A little snuff to produce sneezing will sometimes discharge the

substance. Blowing forcibly into the mouth will sometimes effect a removal. In order that this is effected, the mouth of the operator must be applied directly to the patient's. If a child get any object into the nose beyond your reach or sight, don't get nervous thinking it may "work up into the brain." By studying engraving No. 14, it will be seen that the posterior opening of the nose is into the throat.

BOIL.

A boil is a hard, painful tumor, accompanied by inflammation. Suppuration usually occurs when pus is discharged, mixed with blood and discloses a small, fibrous mass of dead tissues, called the core.

Causes.—Boils are probably due to sudden changes in the nature of the diet, or to the influence of fetid animal exhalations. They also follow debilitating diseases. Boils appear upon any part of the body excepting the soles of the feet and palms of the hands.

Treatment.—Internally, take No. 92 for four to six weeks. Locally, apply water dressing. Poultices may be applied for a limited time, but, if continued much beyond the time of suppuration, they will cause other boils to appear in the adjacent tissues.

Unless very painful it is better to let the boil discharge than to lance it.

CARBUNCLE.

This is an acute local inflammation of the tissue just beneath the skin; is very painful, and especially apt to attack the nape of the neck or back. It is characterized by hardness of the parts, more or less sloughing of the skin and deeper tissues, and marked constitutional depression. It differs from a boil in its tendency to spread its size, and the absence of the central core. It is frequently fatal.

Treatment.—The treatment should be placed in the

hands of a competent practitioner (See article on blood-poisoning, page 289).

CHOKING.

Fish bones and other articles are occasionally lodged in the throat and œsophagus. To facilitate their removal swallow the white of a raw egg; if one is not sufficient try another.

If any substance is drawn into the trachea (windpipe) it is a matter of more seriousness. The patient should be placed, head downward, over a chair or lounge, and sharp raps given him upon the back, between the shoulders. Alternating with this, press suddenly, and with considerable force, at the pit of the stomach.

Children should be taught not to hold pins, coins, buttons, etc., in the mouth. Pins when swallowed, sometimes lead to serious results; oftener, however, they are never heard of again. The swallowing of coins and buttons usually give rise to no bad results.

PILES. (*Hemorrhoids*).

These are small tumors occurring about the anus and within the rectum, caused by the distension of the small veins in the locality from coagulation of blood within the same.

Piles are divided into two varieties: External—without the rectum, and internal—within the rectum. Pile tumors vary much in size, and also differ greatly in the amount of pain they cause. The majority of cases are very painful and exceedingly annoying.

Treatment.—The only positive cure for piles is an operation. They can be greatly relieved by attention to the diet, and using when necessary, No. 116 to keep the evacuations from the bowels in semi-liquid condition.

The following suppositories will be found excellent for

relieving the pain and tenderness; use night and morning after bathing, and replacing the hemorrhoids:

No. 116.

℞

Plumbi Iodidi	ʒ ij.
Tr. Iodidi comp	gtt. xx.
Pulv. Gall	grs. xx.
Ext. Hyoscy	" xx.
Cocoa Butter	ʒ ij.

M. Ft. supposit. No. xx. Sig.—Apply one night and morning as directed.

Much relief will be obtained by bathing the protruding tumors with cold water, to which has been added extract of witch hazel,—a teaspoonful to a cup of water.

CHAFING.

During warm weather many persons suffer from chafing. This can be effectually prevented by thoroughly dusting the irritated parts with either *sub-nitrate of bismuth or calomel.*

RUPTURE. (*Hernia*).

Hernia is a protrusion of a part of the bowels through a natural or unnatural opening. It occurs oftenest in the region of the groin, and is then called *inguinal.* Next in frequency is upon the inside of the thigh, close up to the body, this form is named *femoral.* The third form occurs near the umbilicus, and is termed *umbilical hernia.* Inguinal hernia is much more common than either of the other two forms.

Symptoms.—A lump or tumor, appearing in the localities named, and which increases when the patient stands, or coughs, should excite suspicion that a hernia exists, and a physician should be consulted.

Causes.—The causes of hernia are a hereditary tendency, lifting of heavy weights, jumping, coughing,

straining at stool, etc. Hernia is more common in male than female, the proportion being as four to one.

Treatment.—Always wear a well-fitting truss. If for any reason the truss becomes disarranged, and the hernia "come down," *do not handle it.* Lie down, with the hips much higher than the shoulders, and the knees drawn up. Very likely the hernia will return of itself in the course of a half hour, if not, a physician should be called. A hernia that protrudes and cannot be returned, is said to be *strangulated.* This requires an operation, and delay in having it done only increases the danger.

FAINTING. (*Syncope*).

Fainting is loss of consciousness, caused by a sudden arrest of the blood supplying the brain, attended with pallor of the face, feeble respiration, and weakened action of the heart.

Treatment.—The head should be placed as low or a little lower than the body, the clothes loosened about the neck and throat, and the air allowed free access to the patient. If at hand, a little *spirits camphor* or *aqua ammonia* may be poured upon a handkerchief, and held to the nostrils.

BURNS AND SCALDS.

Slight burns or scalds are best treated by the immediate application of cold water, and afterwards bathing w th white liniment made after directions given in Domestic Recipes.

Burns or scalds of larger extent can be treated by the application of vaseline or cosmoline. In these accidents the principle of treatment is to exclude the air. Where any extent of surface is injured, we advise covering it with double thick cotton batting, on which has been sifted freely wheat flour. The batting should be spread upon the table and the flour sifted over it, and then applied

(flour side) immediately to the burned or scalded surface and bound firmly in place. If the batting, as it rests upon the table, is two inches thick, it will be about right. This excludes the air and makes a soft, easy dressing. Upon the third day this covering can generally be removed. If it is not easily done, leave it until loosened. As an application to follow the removal of this first dressing, take equal parts of limewater and linseed oil, shake and thoroughly wet a soft linen cloth, and lay upon the injured surface, and again cover with the cotton without the flour. The dressing of oil should be changed every day.

If the patient shivers after being burned, or does not seem to mind the pain, it is an indication for the administration of stimulants. For this give fifteen to thirty drops *aromatic spirits of ammonia* in two tablespoonsful of water. Milk, as hot as the patient can drink it, is also excellent. If the pain is severe Dover's powder may be given in three to five grain doses to alleviate it. We have employed, with the best results, this treatment in numerous instances, when the surface burned was extensive. The sooner after the accident the batting and flour are applied, the better.

WOUNDS.

"When the soft parts of the body are divided by any mechanical force applied externally, they are said to be wounded; when the injury is produced by a sharp-edged instrument, the wound is called '*incised;*' when with a pointed one that stabs or pricks, '*punctured;*' when with a blunt instrument that tears, '*lacerated;*' when with an implement that bruises, '*contused.*'" (Bryant.)

Wounds of any extent will require the services of a surgeon. Minor wounds, when the skin is ruptured, should be washed clean by bathing in tepid or cold water, to which has been added pure *carbolic acid*, in the pro-

portion of five drops to the quart, and then covered with a linen cloth saturated with carbolized oil (see Domestic Recipes), and a bandage applied. Contused wounds, when the skin is not broken, should be treated with water dressing, followed by a thorough application of *white liniment*.

FROST-BITES.

When any part of the body has been frost-bitten, as the toes, fingers, nose, ears, etc., Dr. Lapatin of Russia, who has had a large experience treating these accidents, recommends the following (No. 117) to allay the burning, itching and pricking:

No. 117.

℞

Acid Nitric dil. ..... fl. ʒ j.
Aquae Menth. Pip. ..... " ʒ j.

M. Sig.—Use externally as directed.

The affected parts should be painted with this solution, at first once and afterward twice a day. After this application has been made three or four days, the skin becomes darkened, and the epidermis is shed, healthy skin appearing under it. A complete cure by means of this remedy is effected in from ten to fourteen days.

If a foot or hand be frozen to stiffness, and already insensible or nearly so, submerge the affected member in water, so warm that the hand at a normal temperature could not tolerate the heat. Or if an ear be frozen to stiffness, apply cloths wrung out in hot water. The feeling to the patient, after these hot applications or immersions, is one of intense gratification, and is only temporarily interrupted by an acute stinging pain.

Statistics prove that this method of restoration is by far the most preferable, and should be resorted to under all circumstances.

DIARRHŒA OF CHILDREN.

Children are subjected through the summer months to looseness of the bowels, more or less severe. It must be remembered that two to four movements in a child less than six months old is not abnormal, unless the dejections are unnatural in quantity or quality.

A large majority of the diarrhœas of children can be arrested by giving Turkish rhubarb, as directed for *Aphthæ*, on page 296. After acting upon the bowels with the rhubarb, if a remedy is wished to check and regulate the bowels, use No. 118:

No. 118.

℞

Bismuthi Subnit.	grs. xvj.
Tinct. Opii deod.	gtts. xij.
Tinct. Rhei. } *Essence Cinna.*	aa. fl. ʒ ij.
Acid Carbolic. (pure).	gtt. j
Pepsin Cordial (P. D. & Co.).	fl. ʒ ss.
Glycerina q. s. ad.	" ʒ ij.

M. Sig.—ʒ j every two, four or six hours as required.

No. 118 is for a child six to twelve months old; from one to two years, increase the dose one-fourth; previous to six months, give one to three-fourths the amount named in the directions.

Another excellent remedy for stomach and bowel troubles of children is the following, which can be prepared at home, and should be given the same as Castoria:

Fluid extract of wormseed, one and one-half ounces; fluid extract of pumpkin seed, fluid extract of senna, each one ounce; fluid extract of rhubarb, four ounces; bicarbonate of potash, one drachm; rochelle salts, one and one-half ounces; oil of peppermint, one drop; oil of anise, two drops; oil of wintergreen, five drops; alcohol, one ounce; granulated sugar, eleven ounces. Mix according to the following directions:

Put the alcohol in a pint bottle and add the peppermint, anise and wintergreen oils, shake, and add next the fluid extracts, then the bicarbonate of potash and rochelle salts, shake until the two are dissolved, and then add the sugar and fill the bottle with water. As soon as the sugar is dissolved the mixture is ready for use.

As an external remedy for stomach and bowel trouble in children, the following spice plaster will be found of great service. It can remain on for hours, or even days without blistering, and can be used whenever a warming application is required. It makes excellent "drafts" for the feet, calves of the legs, nape of the neck, etc.:

SPICE PLASTER.

Take of powdered cinnamon, cloves, nutmeg, ginger and allspice, each two teapoonfuls; honey and glycerine, one tablespoonful; white of one egg. Mix thoroughly, and apply between layers of cheese cloth. A bandage should be applied over it to keep it in place. If the baby has "colic" pains, indicated by a sharp cry and drawing up of the knees, apply one of these plasters over the abdomen and see what you think of it.

Mothers should be very careful in giving soothing syrups to their babies; they nearly all contain opium in some form. This drug is extremely harmful to children, unless given in very small doses. Cases are on record of children dying from the use of these syrups.

If it is positively necessary to give anything to quiet a child, No. 119 will prove effective and harmless. Dose, from one-half to a teaspoonful once or twice in twenty-four hours.

No. 119.

℞

Camph. Monobrom	grs. ij.
Normal Liquid Hyoscyami (P. D. & Co.)	gtts. viij.
Syrup Lactucarii (*Aubergier's*)	ʒ ij.

M. Sig.—One-half to ʒj once or twice in twenty-four hours.

TOOTHACHE.

When the tooth feels sore to the touch, or gives the sensation of being longer than its fellows, or "grumbles," apply with a swab to both sides of the gum, equal parts of *compound tincture of iodine* and *alcohol*, using it every hour or two till the soreness disappears. If the tooth is hollow, and aches, use No. 120.

No. 120.

℞

Plumbi Acetas	grs. x.
Aquae dist	fl. ʒ ss.
Fluid Opium	" ʒ j.

M. Sig.—Apply to the hollow tooth with absorbent cotton.

CHOLERA MIXTURE.

The following is an excellent mixture for pains in the bowels, and has been referred to on numerous occasions throughout this work. If the reader so wishes, it can be prepared at home, but for those who prefer to have it done at the drugstore, we append in Vol. III a regular prescription. It is known as "Thielemann's Cholera Mixture."

For patients less than twenty-one years of age, the dose should be in accordance with dose table, page 215.

No. 121.

℞

Oil of Peppermint	fluid drachms	2
Chloroform	" "	2
Fluid Ext. of Ipecac (P. D. & Co.)	" "	2
Fluid Ext. of Valerian (P. D. & Co.)	" "	5
Tinct. of Opium, deodorized	" "	6
Ether	" "	8
Alcohol	" "	3
Sherry Wine, sufficient to make	fluid ounces	8

Mix according to art. Adult dose 25 to 30 drops.

FAT AND ANTI-FAT.

Any of our readers who may wish to reduce their amount of adipose tissue should live largely upon the articles named in the left hand column, eschewing those of the right, while any who wish to increase their weight should partake principally of those in the right hand column.

FOR THOSE WHO WISH TO BE LEAN.	FOR THOSE WHO WISH TO BE FAT.
1. Soups.	1. Fats in any form.
2. Beef, mutton and chicken broths.	2. Thick soups.
3. Fish—all kinds except cat and salmon.	3. Sauces and spices.
4. Lean beef, lean mutton, chicken.	4. Hominy.
5. Game.	5. Oatmeal.
6. Lean ham and dried beef.	6. Sweet and Irish potatoes.
7. Eggs (one at each meal).	7. Rice.
8. Veal.	8. Beets.
9. Buttermilk.	9. Carrots.
10. Vegetables—asparagus, cauliflower, onions, spinach, celery, cabbage (cooked in water with lean meat), tomatoes, radishes, lettuce and greens.	10. Parsnips.
11. Bread—white, graham or corn (sparingly), gluten biscuits (not more than four ounces per diem).	11. Starches.
12. Fruits — grapes, oranges, cherries, berries, peaches, sour apples and lemons.	12. Pies, puddings and cakes.
13. Drinks—water, tea or coffee (without sugar or cream) in moderation.	13. Much water.

CHAPTER XIV.

POISON.

Any substance which can injure the health or destroy life is regarded as a poison, if given or taken with intent to do mischief.

Most medicines are poisonous in improper doses, and even common salt has caused death in more than one instance.

Dr. Guy of London, defines a poison to be "any substance which, when applied to the body externally, or in any way introduced into the system without acting mechanically, but by its own inherent qualities, is capable of destroying life."

In the majority of poison cases they are either accidentally administered or taken with suicidal intent.

In this article we do not propose to give specific treatment for all the different accidents which may come under the general term of poisoning, but to advise as soon as it is known that poison has been taken, to first find out of what nature the poison is, and at once send for a first-class physician. In the following paragraph the different poisons have been grouped in eight classes, each class requiring the same treatment. The antidotes therein prescribed should be administered at once, as soon as it is known that poison has been taken. Under no circumstances await the arrival of the physician before you commence to give antidotes. The majority of poisons act quickly, and if you do not resort to the remedies immediately, the doctor may not be able to rescue the patient.

Too much importance cannot be placed on the necessity to determine the class of poison taken, and as soon as the kind is positively known, examine the group to which it belongs, and give the corresponding antidote.

The antidotes are given in the order of their values. Give the one named first if at hand, and if not, the one that is.

GROUP 1.

NAME OF POISON.	ANTIDOTE.
Carbolic acid. Muriatic acid or (spirits of salt). Nitric acid (aqua fortis). Nitro-muriatic acid. Sulphuric acid (oil of vitriol). Cobalt (fly poison). Creosote. Iodine. Croton oil. Pennyroyal oil. Tansy oil. Savin oil. Rue oil. Phosphorus. Muriate of tin.	*Treatment.*—Give white of egg, or flour mixed with water; then cause vomiting by giving a teaspoonful of ground mustard and abundant draughts of warm water; give strong soapsuds, chalk or baking soda with milk, demulcent drinks of flaxseed or slippery elm.

GROUP 2.

Chromic acid. Antimony. Tartar emetic. Cantharides. Blue vitriol. Verdigris. Mineral green. Elaterium. Mercury. Corrosive sublimate. Calomel. White precipitate. Red precipitate. Vermillion. Chloride of zinc. Sulphate of zinc.	*Treatment.*—Give white of egg or flour mixed with water; then cause vomiting by giving a teaspoonful of ground mustard in a glassful of lukewarm water, and after it abundant draughts of warm water; give strong tea or coffee, baking soda with milk, demulcent drinks of flaxseed and slippery elm.

GROUP 3.

Caustic ammonia.
Caustic potash.
Caustic soda.
Ash lye.
Concentrated lye.

Treatment.—Give sweet oil, melted lard and milk.

GROUP 4.

Prussic acid.
Cyanide of potassium.
Oil of bitter almonds.
Chloral hydrate.
Chloroform.

Treatment.—Apply cold effusions to the head; give of brandy or whiskey in tablespoonful doses every fifteen or thirty minutes according to the state of depression of patient and the amount of these poisons taken. Apply mustard plaster to stomach, wash patient with spirits of camphor or vinegar; arouse the patient; give plenty of fresh air; artificial respiration.

GROUP 5.

Cotton root bark and its extracts.
Ether.
Compound spirits of ether.

Treatment.—Cause vomiting by giving a teaspoonful of ground mustard in warm water followed by abundant draughts of warm water; apply cold effusions; wash with spirits of camphor; arouse the patient and give plenty of fresh air. Artificial respiration.

GROUP 6.

Cocculus Indicus.—This poison is often used by disreputable dramshopkeepers in drugging their victims when about to rob them.
Colchicum.
Calabar beans.
Indian hemp.
Gelsemium.
Hemlock.
Opium.
Laudanum.
Morphine.
Santonin (worm remedy).

Treatment.—Cause vomiting by giving teaspoonful doses of ground mustard in lukewarm water followed by abundant draughts of warm water; give strong cold tea or coffee; apply cold effusions; keep the patient in constant motion; give demulcent drinks of flaxseed meal or slippery elm.

GROUP 7.

Aconite. Belladonna. Foxglove or Digitalis. Ergot. Hyoscyamus. (Henbane.) Lobelia. Nux Vomica. Nicotine. Strychnine. Stramonium. (Jimson). Veratrum viride (Am. hellebore). Veratrum album (white hellebore). Veratrine.	*Treatment.* — Cause vomiting by giving teaspoonful doses of ground mustard in lukewarm water, and abundant draughts of warm water; give strong cold tea or coffee and powdered charcoal; give whiskey or brandy in tablespoonful doses every fifteen to thirty minutes according to circumstances; give demulcent drinks of flaxseed meal or slippery elm. Apply warmth to the extremities. Recumbent position should be maintained.

GROUP 8.

Nitrate of potash. Cream of Tartar. Saltpetre. Sulphate of potash. Chloride of Barium. Carbonate of Barium. Lead. Sugar of lead. Acetate of lead. White lead.	*Treatment.*—Give Epsom salt freely, dissolved in water, then cause vomiting by giving a teaspoonful of mustard in warm water, followed by an abundance of warm water. Give sweet milk or demulcent drink.

SPECIALS.

Arsenic. Rough on Rats.	*Treatment.*—Cause vomiting by giving a teaspoonful of mustard in warm water and abundance of warm water; then give hydrated oxide of iron, dialyzed iron or magnesia, in large doses. Follow this up by giving raw beaten eggs with milk, or a mixture of white of egg, milk and limewater. Between times give tablespoonful doses of sweet oil or melted lard.

Oxalic Acid.—From its close resemblance to Epsom salts it has on several occasions been taken by mistake for that medicine.

Treatment. — Chalk, whiting, magnesia, whitewash from the wall, or powdered wall plaster in water must be given immediately, and vomiting should be excited by tickling the fauces. Follow this by giving one ounce of castor oil in one dose. In case of symptoms of collapse administer whiskey or brandy in tablespoonful doses, at intervals of fifteen minutes.

Nitrate of silver.
Lunar caustic.

Treatment.—Give strong solution of common salt; cause vomiting by giving a teaspoonful of ground mustard in a glassful of warm water, followed by an abundance of warm water; give white of egg or flour mixed with water.

In purchasing poison, either for dyeing or bleaching purposes or for the extermination of rats, mice, cockroaches, bedbugs or other vermin, see to it that it is properly labeled, and when not in use, that it be kept out of the reach of children, or, what is still better, under lock and key.

SNAKE BITES.

As civilization advances, these accidents become rarer every day. It happens, however, occasionally. The serpents most dangerous are the following: Rattlesnake, water moccasin, viper and adder.

Treatment.—As soon as bitten, the blood current should be at once shut off as much as possible between the wound and the heart. Thus, when bitten about the lower extremity, tie a rope or handkerchief about four inches above the wound, twisting it with force sufficient to stop the circulation of the blood. Suck the wound and spit the matter out. There is no danger in sucking snake

wounds, provided there is no abrasion on, in, or about the mouth. Give of any kind of spirituous liquor, it makes no difference whether it is whisky, brandy, rum, gin or bitters, half gill doses every ten minutes, or till complete intoxication ensues. Keep the wound covered with common baking soda until it commences to heal. If alcohol is used instead of liquor, dilute with water, about half and half.

INSECT BITES.

Gnats.—The disagreeable itching can be removed by touching the injured places with spirits of ammonia, or rubbing and washing the parts with salt water.

Spider Bites.—Apply carbolic acid, ten per cent., to wound, and if the patient shows depression, use whisky or brandy in tablespoonful doses every fifteen to twenty minutes.

Mosquitoes.—Take a teaspoonful of the *tincture of wild rosemary* to one half tumblerful of water, and apply this lotion where the insect has stung.

Bedbugs.—Apply rags saturated with ammonia, or rub the affected parts with a little white liniment.

Bee, Hornet or Wasp Stings.—Apply to affected parts a little *oil of cinnamon.* Less than a drop will suffice. Larger quantities have a tendency to blister. If oil of cinnamon cannot be obtained, use strong liquid ammonia; or, if the sting happens in the field or in the woods, take a handful of black mud, fairly moist, and apply.

POISONOUS PLANTS.

Stings of Nettles.—Rub the parts with a little salt water or carbolized oil.

Poison Sumach (*Rhus Venenata*) is a plant of the shrub order, six to twelve feet in height, with compound leaves, and found nearly everywhere in swampy places. The plant is quite poisonous, and the effect from contact there-

with is often seen during spring and summer. It is commonly known as poison oak.

Treatment.—The following remedy, if properly applied, will form a coating over the skin, and allay the irritation and itching:

No. 122.

℞

Borax pulv.	ʒ ij.
Acid Carbolic.	ʒ j.
Morphia Sulph	grs. x.
Pulv. Acacia	ʒ iv.
Aqua q. s. ad	fl. ℥ viij.

M. Agitate till solution is formed. Sig.—Apply with camel's hair brush. External use only.—*Dr. L. D., in Med. and Surgical Reporter.*

Poison Ivy. (*Rhus Toxicodendron.*) This plant belongs to the creepers, has trifoliate leaves, and greenish white berries. It is exceedingly poisonous to the touch for most persons.

Treatment.—Make a strong infusion of red sassafras, applying it when cold, and drink of it warm in teaspoonful doses till relieved. The sassafras tea can be taken with sugar and milk if so desired.

This sassafras remedy is also good for poison sumach, described in preceding paragraph.

CHOOSING A PHYSICIAN.

We have had occasion many times, when giving the treatment of the diseases noticed in these pages, to advise the calling of a doctor, and it seems appropriate that a few words as to choosing a family physician should follow. In the first place, we advise that in making a selection you do not take into consideration the "school" or "pathy" to which he belongs. One school has no remedies that the other cannot procure. The questions, however, that should be satisfactorily settled in reference to the physician you choose, are: 1st. Is he qualified? 2d. Is he honest? Unless you are perfectly satisfied upon these points, don't call him.

You should choose your physician when in health, otherwise it may be done in a hurry, and not done well. If you reside in a small hamlet, or the country, do not get the idea that the wisdom is all in the city. "Country" doctors, on an average, are better qualified than those of the city.

Do not estimate a physician's qualifications by the kind or number of horses he drives, or quality of clothes he wears. Don't think because a doctor has a foreign accent that it adds any to his knowledge. Remember that a six months' trip sight-seeing in Europe will not add very greatly to one's knowledge of diseases.

When you have made your choice it will not be out of place to say as much to the physician, and invite him to your home. Give him your confidence and encouragement. Don't expect him to be infallible. If, for any reason, you decide to change to some other, *don't fail to pay him his bill.* You have no right to change until you do so. Some people are always saying a good word for their doctor until he wants his pay, and then they say everything against him they know, and sometimes more.

These are robbers of both purse and reputation. Fortunately this class is not numerous.

The following rules for selecting a doctor are taken from a medical exchange. They are worth pondering, and in connection with what has been written upon the subject, any reader should be able to select a suitable medical attendant:

Avoid a mean man, for you may be sure he will be a mean doctor, just as certain as he would make a mean husband.

Avoid a dishonest man; he will not be honest with you as your physician.

Shun the doctor that you can buy to help you out of a scrape—a good doctor cannot be bought.

Avoid the untidy, coarse, blundering fellow, for the man who is clumsy in hitching his horse you may be sure is not handy at midwifery or surgery.

Avoid the doctor who flatters you and humors your appetites.

Avoid the empty blow-horn who boasts of his numerous cases and tells you of seeing forty or fifty patients a day, while he spends two hours to convince you of the fact. Put him down as a fool.

To be a good doctor, one must first be a man in the true sense of the word.

He should be a moral man, honest in his dealings.

He must have good sense, or he cannot be a good doctor.

He should be strictly temperate. No one should trust his life in the hands of an intemperate doctor.

It it a good sign if he tells you how to keep well.

It is a good sign if the members of his own family respect him.

It is a good sign if the children like him.

It is a good sign if he is neat and handy in making pills and folding powders.

It is a good sign if he is still a student, and keeps posted in all the latest improvements known to the profession for alleviating human suffering.

We wish to add that it is a good sign if he admits occasionally *that he don't know.*

CHAPTER XV.

THE NURSE AND NURSING.

It is not the purpose of the following advice and hints to instruct professional nurses in their duties, but to give such practical information to any person who carefully reads, as will enable him or her to take charge of a patient for a few days or longer, and render intelligent services. Many ladies who have not had the time or means to allow of their having a course at the training school, will, we trust, be able to find some practical hints that will be of material aid to them in becoming self-made nurses.

Above all, we wish to instruct our readers in such a practical way, that they may be able to care for those who are near and dear to them. Affection does much to soften the touch, and make palatable unsavory potions, and for the patient whose mind is clear, no one can prepare quite so savory gruel or broth, or lay a sheet so free from wrinkles, or shape a pillow so it will give so great ease to an aching head, as wife or mother; and of these we ask a careful study of what follows in reference to this subject.

The nurse should be always neatly and quietly dressed. Ornaments of every kind should be avoided, but when *absolutely necessary*, should be of as simple a character as is possible. A nice bouquet is very appropriate, and helps to cheer the patient.

A nurse should always have clean hands and nails, taking especial care to cleanse them thoroughly after dressing any wound; and while carefully avoiding wasting too much time in adjusting and readjusting her dress, should always endeavor, in her person, to set before her patients an example of neatness and cleanliness.

A nurse should always take her regular meals, and never enter the sick room with an empty stomach. Non-observance of this rule often lays the foundation of a headache or disinclination for work during the rest of the day, which is seldom traced to the true cause.

POINTS FOR OBSERVATION OR INQUIRY.

Present Appearance.—Notice, as opportunity occurs, whether there be any wounds, scars or eruptions (partial or general), on the skin; whether there be any unnatural swelling or tumor in the groins, upper part of thigh or elsewhere, such as is likely to be caused by a rupture, aneurism, etc.

Action of the Bowels.—Whether regular, confined, relaxed or painful; whether evacuations be watery, colored or containing blood or mucus; if blood be passed, whether it precede, accompany or follow the same.

Urine. — *Quantity*, under or over two pints; light, dark, red, brown or yellowish; *consistency*, thick or clear; *sediments*, gravel, pus, etc.; *smell*, normal or offensive; frequency of micturition by day and night; *painful* or not. It should be remembered that patients, especially those suffering from paralysis, are liable to a condition in which the bladder becomes over-distended, and although there is a constant dribbling away of water, this is not to be considered as a sufficient relief for the bladder, and should not be considered as passing water freely.

Expectoration.—Quantity, character, whether following violent fits of coughing, etc.

Appetite.—Good, failing, or voracious.

Sleep.—By day and night.

Menstruation.—Frequency, duration, if painful, character of discharge, profuse or scanty.

VENTILATION.

The air is composed mainly of two gases—oxygen and nitrogen—with a very minute quantity of carbonic acid gas. With every inspiration we require to take in with the air a certain amount of the gas called oxygen, and with every expiration to get rid of a certain quantity of that called carbonic acid, in order that the purity of the blood may be maintained.

If the atmosphere in which we live were limited, and not acted on by any other agent than ourselves, a time would come when there would be no more oxygen left, and when the air would contain a poisonous amount of carbonic acid, the result being that we should die, just as a candle would go out for want of oxygen when placed under an inverted glass. There are, however, of course, different stages of this gradual poisoning, which, although not actually causing death, are productive of serious injury and disease, and it therefore becomes the duty of every nurse to see that a constant supply of fresh

air is always provided for her patients, taking care that there are no draughts, and that the room is not made unnecessarily cold. The principal agents for ventilating a room are the windows, the door, the chimney, and any special apparatus that may be provided for the purpose.

The Windows can, in most cases, be always kept open to the extent of an inch at the top, and it is no substitute for this to throw open the whole of the windows in the morning, and set the patient sneezing and complaining of the cold.

The Door is being constantly opened during the day, and it is, therefore, a valuable source of fresh air during that time; but it should not be left open at the same time as the windows, and never longer than is absolutely necessary.

The Chimney.—When there is a fire in the grate, the chimney is the best possible ventilator, for as the current of warm air is constantly ascending the chimney, a fresh supply of air is constantly being drawn in to supply its place. There is only one word to be said regarding special ventilators, and that is, *use them.* Over and over again, in private houses, you may see these safety-valves of health blocked up with paper or rags, and every possible attempt made to render them useless. The nurse should take care that nothing of this sort is done, and remember that while pure air is often the most effective restorer of health, so the want of it is the cause of half the diseases in the world.

The nurse should make it a rule to see every morning that the closets are perfectly clean, kept constantly flushed, and that there is no accumulation; that the sinks and wash-up tanks are also thoroughly clean and flushed; and that there is a free current of air admitted into the water-closet.

THE MANAGEMENT OF THE FIRE.

Here, perhaps, it is not out of place to say a few words concerning the management of the fire. An even temperature should, as far as possible, be maintained, and for this purpose it is safer to watch the thermometer than to be guided by mere sensation. Between sixty and sixty-five degrees Fahrenheit will be found most suitable.

The fire should never be let too low, and opportunity should be taken of the moments of wakefulness, and if the sleep continues sound, small, separate knobs of coals previously put in readiness and wrapped in thin paper, should be placed on the fire with the fingers; in case no previous preparation has been made, it is a good plan to

be provided with an old glove to protect the fingers in this work, and all unnecessary poking and raking of the grate avoided; for any slight rearrangement of the embers, a small stick does equally well as a poker, and is less noisy.

BED.

In the case of fractured limbs, the arrangement of the bed is of the utmost importance, but in all cases the comfort of the patient largely depends on the attention that is paid to this point. The greatest attention should be paid in order to keep the under sheet, on which the patient lies, smooth and free from crumbs or other irritating particles, as there is nothing more wearying to the patient or more likely to give rise to troublesome sores, than wrinkles in the sheet, or the neglected crumbs of successive meals.

A nurse should endeavor to provide the patient with bed covering adapted for the season of the year; otherwise it is more than probable that a visit to the room at night would discover it in an untidy condition, through the patient's wearing apparel being heaped on the bed in winter, or the floor strewn with superfluous blankets in summer. The bed should be tidied and put straight every day, and in ordinary cases the bedclothes should at the same time be stripped off and allowed the benefit of a free access of air; the patient meantime being covered with a couple of spare blankets; but where the patient's ailment renders this undesirable, it should be done as often as possible consistently with the welfare of the patient. When remaking a bed, never allow the bedclothes to lie about on the floor, but always arrange to have a chair or other resting place for them. It is a great comfort to a patient, when it is possible, for the mattress to be changed once or twice a week.

DRAW SHEET.

The draw sheet is a spare sheet or half sheet, folded lengthwise two or three times, and placed under the patient in cases of helplessness, or where a long stay in bed may be expected. In width it should reach from the waist to just above the knees; any extra length should be kept rolled up on one side of the bed. The draw sheet may be shifted a little frequently during the day, and should be entirely removed, smoothed and freed from wrinkles and crumbs, night and morning. When soiled it should, of course, be at once changed.

CHANGING SHEETS.

The two points at which to aim in changing sheets for helpless or infirm patients, are first, the avoidance of chill and unnecessary

exposure, and second, to disturb the patient as little as possible. It is desired in all cases to have two persons work together.

To Change the Upper Sheet.—First loosen the bedclothes all round, then let a person stand at the head of the bed on each side, with the clean sheet gathered loosely together, then each taking hold of a corner of the soiled sheet, draw the clean sheet down over the patient, at the same time withdraw the soiled sheet down over the patient and out at the foot of the bed. *Or*, loosen all the bedclothes as before, and remove the upper blanket and counterpane, leaving only the sheet to be changed with a blanket over it; then spread the clean sheet on the bed, and while one person on one side holds the clean sheet firmly, let the nurse on the other side rapidly withdraw the soiled sheet and blanket.

To Change the Under Sheet.—The clean under sheet may be introduced at the head of the patient, and the soiled sheet removed at the same time, as explained in changing the upper sheet. *Or*, if the patient may be safely rolled on his side, do this; then roll the soiled sheet close up under the patient to the middle of the bed; introduce the clean sheet with one-half rolled up close to the rolled-up sheet, then turn the patient first on his back and then on the other side, when the soiled sheet may be readily removed and the clean sheet smoothly spread.

WASHING PATIENTS.

A nurse should make a point of seeing that her patient has the face and hands washed every morning, the feet at least twice a week and that in addition, the patient, if possible, has a warm bath at least once a week. A good wash at night in addition, will often help to secure a night's rest. Many patients are able to do this for themselves; but in every case it should be the nurse's duty to take care that it is done efficiently, as there is little hope of progress in a case where disease is assisted by the presence of dirt. Slops of every kind should be carried out of the room and thrown away as soon as possible, and should on no account be allowed to remain in the room longer than is absolutely necessary.

DRESSING PATIENTS.

The body linen of bed-lying patients should be changed at least once a week, and if possible more frequently. This changing requires some little care on the part of the nurse, and especial attention should be paid to the following points:

1. Never begin to change until you have *all* you are likely to require *ready*.

2. Be careful that there is no draught on the patient from some open door or window.

3. Let the fresh linen be properly aired and warmed beforehand.

4. Do not move or uncover the patient more than is absolutely necessary.

5. Do not let the patient help too much, and, on the other hand, take care that they (male patients especially) do such things as they can and ought to do for themselves.

FEEDING PATIENTS.

This is generally allowed to be the special province of the nurse, and in many cases the recovery of a patient from a dangerous illness is due to the steady regularity with which the nurse has attended to each turn of a capricious appetite, and administered food in the form most palatable at the moment. Ordinarily, the nurse should see that her patient has what is necessary for him, and that they do not make themselves ill with unsuitable food introduced in ill-judged kindness by mistaken friends.

It is worth remembering that in many cases where it seems impossible for a patient to take in a moderate quantity of food without vomiting, he can often take it in very small quantities at frequent intervals without any unpleasant symptoms. Let everything that is used be perfectly clean, and arrange that the food of the patient is hot. When the patient is taking milk, beef tea or such, the nurse should take care that some is put by for the night, as the most urgent need for its use may arise during that time.

THE DRESSING OF WOUNDS.

Wounds should never be uncovered for the purpose of being dressed until everything that is likely to be required during the process is close at hand. Old dressings that have become *adherent* to the surface of the wound should *never be pulled off sharply*, but should be previously loosened by bathing with warm water, or by the application of a bread poultice.

Discharges may be cleaned away from the edges of a wound, and from the surrounding parts, but the surface of the wound itself should be left undisturbed. Cottonwool soaked in water should be used for this rather than sponges, which are liable to carry infection from one patient to another unless very carefully cleansed after use. To prepare cottonwool fort his purpose, place a portion of a layer in a flat dish or plate, and pour boiling water on it; the wool will afterward more readily soak up cold water or the lotion that is used.

The ordinary India-rubber enema syringe is very useful in dressing foul wounds, enabling the nurse to keep a constant stream of fluid over the part to wash away discharges or loosen dressings without actual contact. The fluid which has traversed the affected part should be received in a basin previously placed in a convenient position.

Nurses should be careful not to touch their eyes with their fingers while engaged in dressing a wound, as in some cases loss of eyesight, or other serious injury, may be caused by the irritation set up by the presence of a drop of matter on the surface of the eye. This caution also applies with regard to the use of towels soiled with discharges for wiping the faces of others. They should carefully cover any wound or scratch on their fingers with a plaster before dressing any wound. The following list comprises nearly everything likely to be required in the dressing of wounds:

A pair of forceps, scissors, pins, lint, cottonwool, tow, bandages, sticking plaster, sponges, some soft rag, a clean half-sheet, warm water, hot water in a tin for heating the plaster, a dust-pan, for the soiled dressing, simple dressing, or a saucer containing the special ointment or lotion for application to the wound. In the case of a patient who is extensively burnt over a large surface of the body, the nurse should be careful not to expose the *whole* at once to the air when dressing it, but should dress it in small portions successively.

THE USE OF ICE.

When ice has to be kept near a patient so as to be available for constant use, and a refrigerator is not within reach a large lump should be obtained and wrapped in two or three layers of thick flannel. If any is required for use, a small piece should be split up into smaller bits and placed in a saucer within reach of the patient.

If the patient has to be left long alone, the ice must be put on a drainer so as to allow the water resulting from its melting to flow away. The drainer of a soap dish *well washed*, or a clean piece of linen rag or muslin tied over a glass or cup, will answer the purpose.

When ice is to be applied to the head or any part of the body it should be split up as before, and applied in India rubber bag, or a bladder or a sponge bag will sometimes answer the purpose, but whatever is used should be large enough to completely encircle the part affected. The bag should be opened at intervals, the water removed, and fresh ice added. A freezing mixture is made by pounding together equal parts of ice and common salt.

THE ADMINISTRATION OF MEDICINE.

Medicines should be given at regular hours, and careful attention should be paid to the direction as to the time when they are ordered to be given, as, for instance, before or after meals. The *exact* quantity of medicine ordered should be given, as even a slight error may cause serious illness if often repeated. Any mistake should be at once reported, as *prompt* use of remedies gives the only hope of saving the patient in case of poisoning.

It is a good plan to keep a separate spoon for oily or strong smelling medicines, such as castor-oil, cod-liver oil, valerian or asafœtida, since it is not easy to get rid of the smell at a moment's notice. Powders are conveniently given either mixed with a little water or milk, or made into a paste with jam or honey. If a patient be unable to take pills, they should be mashed up in a little jam, and washed down; but if, when administered by the nurse they are placed well back in the throat, the patient is almost certainly compelled to swallow them. In capsules now so easily obtained, some patients can take capsules when they cannot take pills; the former can therefore be used for macerated pills.

When a person absolutely refuses to take medicine the nurse is obliged to administer it by force. In that case, she should close the nostrils of the patient with one hand, and when the mouth is opened, should pour the medicine well back in the throat with the other. This, however, is a proceeding which is seldom necessary, and which may generally be taken as a sign that either firmness or kindness of manner is wanting on the part of the nurse. If medicine appears to the nurse to be producing any marked symptoms in a patient, such as vomiting, diarrhœa, pain in the stomach, headache, drowsiness, convulsive movements or twitchings of the muscles, faintness, running at the eyes, nose, or mouth, or if a nurse discovers that by some mischance a patient has had an over dose, or that any mistake has occurred, she should at once inform a medical practitioner.

SUPPOSITORIES.

Suppositories are generally used for one or two purposes, either as astringents or to relieve pain. If the patient be unable to apply the remedy himself, the nurse must do as follows:

The patient should lie on the left side, with his knees drawn up and the nurse standing behind him, should pass her right hand under the clothes, and telling the patient to make an effort to bear down, she should at the same moment introduce the suppository

inside the anus, pushing it on the tip of the finger well into the interior of the bowel.

ADMINISTRATION OF ENEMATA.

Enemata are used for very many purposes, and may be either purgative, stimulant, or nourishing; formulæ for their preparation are given elsewhere. The method of administration is as follows:

The patient should lie on his left side close to the edge of the bed, with his knees drawn up, the basin containing the substance to be injected being placed on a chair or stool by the side of the bed; the nurse then standing behind the patient, should pass the tube of the syringe (previously well oiled and softened, if necessary, by immersion in hot water) through the anus for about four or five inches along the bowel, in a direction first backward and then a little forward, but on no account whatever is *force* to be used in order to overcome any obstruction that may exist.

The injection should be done slowly, with a moderate amount of pressure, and should be stopped at once if the patient asserts that he cannot bear any more. For nutrient enema, from four to six ounces at a time are sufficient; for cleansing purposes, from one to two pints, and even more may be used. Before giving a nutrient enema, the bowel should be cleared by a simple injection of warm water. Injections of glycerine are sometimes used in cases of constipation; the quantity used is commonly from one to three teaspoonfuls, and for the purpose of these injections a small syringe having a long metal, bone or India-rubber nozzle, is required.

BLISTERS.

Blisters are of different shape according to the part to which they are applied; the time required for the action varies, but it is usually from six to eight hours. By gently raising the edge on one side, the question as to the appearance of the blister may be settled. When the skin is properly raised by the effused liquid, it should be carefully removed by cutting with a pair of scissors, and the raw surface dressed with the ointment prescribed, which is either irritating or soothing, according to whether it is desired to keep open or to heal the wound produced by the blister.

FOMENTATIONS.

Fomentations are generally used for the purpose of allaying pain, but they may be also ordered in other cases as for encouraging the bleeding from leech bites to prevent inflammation after acupuncture, etc. Simple fomentations are most easily prepared by inclosing the

flannels to be applied within a double layer of toweling, with a sufficient excess of length left to allow of wringing; this should be laid in a flat basin or tin, and the boiling water poured over it; the ends of the toweling may then be twisted and the greater part of the excess of water may be squeezed out without scalding the nurse's hands; but it must be remembered that if the flannels be applied too hot, the patient may suffer pain instead of obtaining relief. The whole should be covered with a piece of mackintosh or oiled silk, for without this precaution fomentations are worse than useless, as a few minutes serve to convert the warm, comforting flannels into cold, clammy wet ones, and what was intended to be a comfort becomes a source of annoyance to the patient.

Tincture of opium or spirits of turpentine are sometimes sprinkled over the surface of the flannel to relieve pain, but this should never be done without special directions. Poppy fomentations are made by boiling crushed poppy heads in water, straining and saturating the flannels in the decoction.

LOTIONS.

Lotions are usually applied on lint or a rag which has been previously soaked in the lotion required. When it is desired to produce a cooling effect by the evaporation of the lotion, only one layer of material should be applied, no oiled silk or gutta percha being used, and the application should be repeated at very frequent intervals.

LINIMENTS.

When any remedy in a liquid form is applied to a part by rubbing, it is called a liniment, and may be soothing, as belladonna; stimulating, as compound camphor; counter irritant, as croton oil liniment. Liniments and lotions must be regarded as *poisonous*, and great care should be taken that there is no chance of their being administered *internally*.

It is obviously the nurse's duty to administer all medicines, and apply all lotions, liniments, etc.; but it may occasionally happen that the frequency with which this is required renders it necessary that the patient should renew the application himself. Especial care should be taken that no saucer, cup or basin should be within reach but the one containing the required remedy. Serious accidents might follow if the patient were unwittingly to mistake a vessel containing lotion for that in which he had been accustomed to find his toast and water, or other drink. This caution is especially needed in cases where the room is darkened for the benefit of the patient with injuries or diseases of the eyes.

SYRINGES AND DOUCHES.

It is sometimes the duty of the nurse to syringe, or superintend the syringing of passages or cavities. *The external ear passage* may require to be syringed for the removal of solidified accumulations of wax or foreign bodies, such as peas, beads or insects. A little olive oil or glycerine dropped in on the previous night will make the removal of wax easier. The water used should be of moderate warmth, and care should be taken not to touch the ear with the point of the syringe, and not to use undue force, as the drum of the ear, and especially in children, is not very far from the opening, and it might be easily damaged by violent syringing.

The Nose.—For syringing the nostrils, either a syringe or douche may be used. In either case the patient would escape a great deal of discomfort if he could be persuaded to breathe steadily through the open mouth during the operation, as in that case the fluid forced into one nostril will readily escape by the other. For the douche all that is required is a piece of small sized India rubber tubing about two yards long, to reach from the bottom of a jug of water or lotion placed above the level of the patient's head. The water is started flowing through this by sucking the free end until it is full; then when the stream is flowing freely the end of the tube is inserted into one nostril, while bending over a basin and breathing in the manner indicated above.

HOT BOTTLES AND TINS.

When it is desired to lessen shock, to revive a patient after an operation, or simply to lessen a feeling of cold, dry heat may be applied by means of hot water contained in tins, earthenware jars, gutta percha bags, etc. Care should be taken not to place these immediately next the skin, but to interpose a layer of flannel or blanket.

The local effect should also be noticed from time to time, especially if the patient be asleep or otherwise unconscious, as troublesome burns are likely to be caused by prolonged application of a heat that may be bearable for a short time. A convenient way of applying dry heat is by the use of salt made hot in a frying pan and inclosed between layers of flannel.

TREATMENT OF BEDSORES.

In some very long cases, especially when patients are suffering from paralysis, bedsores cannot be altogether avoided, even with constant care and watchfulness; but it is to be feared that they

occur more frequently than they need, owing to neglect on the part of nurses. Bedsores vary in degree from a slight abrasion of the skin, with a diffused redness around to large deep sores, involving all the tissues down to the bones. They occur over the prominent points of the patient's body, upon which the weight especially falls as he lies in bed—as over the lower part of the back, the buttocks, the projecting points of the shoulders, etc. To guard against their occurrence—

1. The under sheet should be kept smooth and free from wrinkles or crumbs.

2. The patient should be kept as dry as possible, all discharges being cleared away frequently.

3. The position of the patient should be varied as frequently as possible.

4. The back should be examined daily and washed with a strong solution of alcohol, and after having been thoroughly dried, should be dusted with corn starch.

5. When any indication of redness appears the patient should be supplied with water or air cushion, or the part should be covered with some thick felt, having a circular hole corresponding to the inflamed spot. When the skin has once broken the sores must be treated on the same principle as other similar wounds.

NIGHT STOOLS, BED PANS, ETC.

Although it is well to discourage as much as possible the use of the above named in patients who are wanting in resolution to go to the closet, it is most important that when assistance is wanted in this respect, the patients should be attended to *at once*, however often they may require it, without delay, or a fresh display of grumbling on the part of the nurse on each occasion.

Many cases are undoubtedly lost, or very much injured, on account of the mock modesty of an inefficient nurse, who would often rather run the risk of allowing a patient to die from the effort of getting out of bed than take the trouble of attending to his wants herself. The following cases are among those that should not be allowed out of bed on any consideration: Recent amputations, all fractures (except upper extremity), typhoid fever, rheumatic fever, ovariotomy, hernia, etc. Night stools and bedpans before use should always contain a clean water or disinfecting fluid, and should be cleansed *immediately* after use, and should never be carried about without being covered. For the sake of decency screens should always be placed around the bed of any patient making use of the bedpan or night stool.

DISINFECTANTS.

Disinfectants are used for two purposes: First, to destroy germs or seeds of disease, and for this purpose require to be of such form and applied in such manner as to reach the possible sources of infection. For instance, a solution of "Disinfectant lotion" (Useful Recipes) may be useful for washing the hands, or for bedpans, etc.; but it is not so diffused through the air of the sick room as a solution of carbolic acid would be. Disinfectants are also commonly used to mask or hide unpleasant smells, but it must not be supposed because one smell is overpowered by another that therefore all strong smelling things are disinfectants.

During the progress of a case of infectious disease care should be taken that no linen or clothes should pass out of the sick room unless disinfected, and for this purpose it is well to be provided with a pail of water containing some disinfecting solution, into which the articles may be dipped. To assist in keeping the air of the sick room pure, it is desirable to have about the room some shallow dishes containing the disinfectant; but it must be remembered that many of the most valuable disinfectants, and especially carbolic acid, are poisons, and the nurse should be careful to avoid the risk of children drinking the solution. For washing the hands, a few drops of carbolic acid may be added to an ordinary basin of water. For sprinkling a room the same strength of each may be used. For dipping wearing apparel and bed linen a tablespoonful of either of the first named may be added to a bucket of water.

UNDRESSING THE PATIENT.

If possible a patient should always be undressed before being put into bed; and, except where he is able to *walk*, he should not be allowed to move himself from the stretcher. All *tight clothing about the neck* should be *at once loosened* or altogether removed.

Boots should be removed with great care, and while withdrawing a boot with one hand, the other should be employed to steady the limb at the ankle. If the leg be broken, it is better at once to cut the boot down the side than to run the risk of doing further injury to the limb.

When the garters are removed stockings may be drawn off without any difficulty, but a nurse should always make a point of seeing that the garters or straps confining the stockings *are* loosened or removed before any attempt is made. This is often forgotten, and the consequence is considerable discomfort to the patient and annoyance to the nurse. The braces which keep up the trousers

should also be entirely removed. It does not suffice merely to unbutton them in front, as the straggling ends are only in the way and inevitably cause confusion.

Trousers need not be injured except in the case of patients suffering from a fracture of the lower extremity, when the outside seam of the trousers should always be ripped up, as the damage thus done is easily repaired, and the patient will gain largely in comfort. Before attempting to remove the trousers the patient should be slightly raised from the stretcher, and while one person steadies the limb another should draw away the clothes, previously taking care that the under linen of the patient is so arranged as to avoid any indecent or unnecessary exposure.

On taking off the coat or waistcoat it is better to remove one sleeve at a time, always commencing with the sound limb. The other will then follow without difficulty. Although it is quite right to care less for the clothing than for the comfort of the patient, a nurse should not necessarily injure anything by acting in a hurry. There is always time to look out for a suitable place to cut open, and very little is gained by tearing first in one direction and then in another, when a little steadiness and forethought would have warded off the damage.

When the patient is unable to walk the stretcher should be placed on the floor with its head close to the foot of the bed and lying in the same direction, this position being that in which there is least difficulty in lifting the patient into bed. In lifting a helpless or injured patient the weight should be evenly distributed, and the duty of taking care of an injured limb should always be allotted to some one person. Three people are necessary to properly lift an adult patient. Of these one should support the head and chest, the second and strongest should lift from the hips, the third should take the thighs and legs.

In some cases the size or arrangement of the room will not permit this. The stretcher must then be laid alongside the bed, three assistants lifting the patient into the air, while the fourth rapidly withdraws the stretcher to allow the bearers to closely approach the side of the bed. All should commence to lift together, and set down the patient at a given signal, special attention being always given to the injured limb. The bedclothes should be folded back, for the whole length of the bed on one side, leaving one-half uncovered to receive the patient. They are then easily replaced with the addition of a cradle when required.

HEMORRHAGE.

There are three methods of stopping bleeding which are in the nurse's power, and with which she should be familiar:

Pressure at the Bleeding Point.—Blood may often be seen to flow from one small point only of a wound. Slight pressure with one finger over the spot will usually stop it as long as the pressure is kept up, and often altogether even after the pressure is removed.

PRESSURE ON THE MAIN ARTERY SUPPLYING THE WOUND.

With a little patience and instruction from some qualified person, a nurse may soon learn the exact spot on which the pressure should be made; but if this is not to be had, in the case of wounds of the arm or leg, the nurse should apply a roller bandage as tightly as possible around the limb above the wound; this pressure must not be kept up very long, as mortification may be produced by it.

THE APPLICATION OF COLD.

This plan answers best when the bleeding is from several points scattered over a large surface; it is conveniently applied by letting cold water drip from a sponge onto the bleeding points, or by the application of ice in a mackintosh bag. The part from which the blood comes should be raised above the rest of the body, and if the patient becomes faint he should not be roused immediately, since faintness acts as Nature's remedy by lessening the force and activity of the flow of blood. Blood from the arteries is of a bright red color, and bursts out in spurts, while venous blood is purple red, and flows in a steady stream.

One of the most common sources of sudden bleeding is that which proceeds from the rupture of a varicose vein in the leg; the treatment in this case will consist in laying the patient down, raising the limb, and applying a steady pressure by a pad and bandage to the bleeding point. The surgeon should be informed in all cases of bleeding, even although the bleeding be quickly controlled, as a nurse cannot judge as to the best treatment to be followed to prevent a recurrence of the symptoms.

INSENSIBLE PATIENTS.

When left in charge of a patient who is insensible, do not use any violent measures in order to arouse him; lay him in bed, or on the floor, loosen whatever is round his neck, and let him have free access to air.

Notice whether the breathing is quiet or noisy, regular or irregular, whether there are any convulsive movements of the limbs, whether the urine or fæces be passed involuntarily, whether the pupils of both eyes are alike, or larger or smaller than natural, whether the patient will bear to have his eyes touched, and whether he can be roused at all.

DELIRIOUS PATIENTS.

Avoid any roughness in dealing with delirious patients, but always be firm, and never let them see you are afraid of them, or inclined to let them have their own way. Do not attempt to argue with them or to contradict any of their assertions, but at the same time it is well to appear as interested in their conversation as possible. See that the lower part of the windows are carefully fastened down, and that there are no knives or dangerous weapons within reach of the patient. A nurse should never be left alone with a patient in a delirium, unless *immediate* assistance is available *at a moment's notice*.

FAINTNESS.

In any case of faintness, the patient should be at once placed in a recumbent position, all tight clothing about the neck and chest be loosened, and a supply of fresh, cold air secured. Water dashed on the face, or applied by means of a wet towel, is the best restorative.

If it is impossible or inconvenient to let a patient lie down flat, considerable relief may be obtained by the patient remaining in a sitting posture and bending the head downward and forward to the knees. If smelling salts or any preparation of ammonia be used, care must be taken that they are not used too persistently, as serious injury may be thereby caused to the lining membrane of the respiratory passages.

BATHS.

For administering a bath for anything but cleansing purposes, it should be remembered that the benefit to be derived from a bath is usually dependent upon the maintenance of healthy reaction after it. For instance, a cold sponge bath may be well borne and have an excellent tonic effect upon the patient if allowed to stand either in warm water or on a hot, dry surface, and provided with hot, dry towels or loose wrappers afterward.

The temperature of all baths must be ascertained by using a thermometer, and during all the time of the patient's immersion the same heat should be maintained. In preparing a bath always turn on the cold water *before* the hot.

TEMPERATURE OF SIMPLE BATHS.

Cold	33 deg	65 deg.	Fahrenheit.
Cool	65 "	75 "	"
Temperate	75 "	85 "	"
Tepid	85 "	92 "	"
Warm	92 "	98 "	"
Hot	98 "	112 "	"

Soda Bath.—One pound of common soda to the bath.

Sulphur Bath.—Sulphurated potash, 1-4 pound to the bath.

Salt Water Bath.—1-2 pound to 4 gallons.

Mustard Foot Bath.—Powdered mustard, 2 to 4 ounces; hot water, 4 gallons.

SICK ROOM COOKERY.

Scrupulous cleanliness is always necessary in a kitchen, but in a sick room it is indispensable. Always be sure that everything you use, whether sauce pan, spoon, or feeding cup, is absolutely free from any taint of what has previously been contained in it. All cups or basins, especially those which have contained milk, should be thoroughly cleansed with hot water before using again.

The next thing to be remembered is that the manner in which the food is served has a marked effect on the manner in which it is accepted by a sick person. Rather offer always less than more of anything; there is nothing so nauseating or disheartening to a patient as to be offered what would be oftentimes more than enough for a person in health. An ounce or two of meat, nicely minced and served up hot with a sprinkling of salt, with a potato mashed, will generally be accepted where a slice of meat which involves the trouble of cutting up, would be rejected.

Mutton Broth.—The lean part of necks and loins should be cut up into small pieces, and all superfluous fat removed; about one pound of neck of mutton thus prepared should be placed in a saucepan containing a pint of cold water, and placed on the fire, and as the scum rises to the top it should be carefully removed; when this ceases, let the broth boil for about two hours, strain, and flavor. A teaspoonful of pearl barley is often acceptable, added when the broth begins to boil.

Chicken Broth is prepared by immersing the parts in cold water in a saucepan, and letting it boil for two hours, skimming off the superfluous fat.

Chicken Panada is made by rubbing together in a mortar the meat from the breast and wing of a roast or boiled chicken, with an equal quantity of stale bread, then add gradually the water in which the

chicken was boiled, or other broth. Boil for a few moments, and rub through a fine sieve.

Meat Jelly.—Take one pound each of rump steak and lean mutton, put all finely cut up into a jar, cover over or tie down tightly, place the jar in a saucepan half full of water, and let it stand for three hours on the fire; then press the meat through a sieve, and add to the essence half an ounce of isinglass dissolved in a quarter of a pint of water; when cold, take off the fat.

Another Way.—Take one pound each of beef and veal, boil in a close jar as above for four hours; if too strong add a little water, then strain into a mould.

Barley Cream.—Soak an ounce of pearl barley in cold water for two or three hours, take half a pound of veal cutlet pounded to a pulp, and rub through a sieve with the barley, then boil with two or three tablespoonfuls of cream.

Calf's Foot Jelly.—Thoroughly clean two calves' feet, cut into pieces and stew in two quarts of water till reduced to one quart; when cold take off the fat, and separate the jelly from the sediment. Then put the jelly into a saucepan with white wine and brandy and flavoring to taste; with the shells and whites of four eggs well-mixed together, boil for a quarter of an hour, cover it and let it stand for a short time, and strain while hot into a mould through a flannel bag.

Bread Jelly is made of stale bread steeped in boiling water and then rubbed through a sieve or piece of muslin, flavored with sugar or salt according to taste, and set aside to cool.

SIX WAYS OF COOKING AN EGG.

1. *Simple Boiling.*—Set a saucepan nearly full of water on the fire, and when the water boils put the egg in with a spoon and leave it from two to three minutes.

2. *Poached.*—Put a tablespoonful of salt into a saucepan of boiling water, then break the egg carefully into it and let it boil gently for three minutes, then take it out with a large spoon or slice, set it on a plate to drain, then serve on toast.

3. *Another Way.* Break the egg into a cup, then stir the boiling water in the saucepan rapidly round with a stick, and as it is whirling drop in the egg, and let it revolve for three minutes, then serve on toast.

4, 5. *An Omelette* may be either *sweet* or *savory* according to the flavoring which is added, otherwise the preparation is the same in both cases. Place a good-sized piece of butter or lard in a clean

frying-pan, and while it is dissolving break the egg into a teacup containing two dessertspoonfuls of milk, ahd mix it well together with a fork, adding the flavoring, sugar or salt, pepper, parsley, etc., as required, and when the fat is hot enough, then pour the egg into the middle of the pan and keep up a constant though gentle agitation of the pan all the time, about five minutes, to prevent the egg sticking to the bottom, then roll it together like a pancake, and serve.

6. *Snow Eggs.* Take a small teacup of new milk and boil it in a small shallow saucepan with a little sugar; while it is boiling break the egg, putting the yolk and white in separate cups, whip up the white to a fine light froth, and when the milk is quite boiling, take a large spoonful at a time of the white, place it on the top of the milk for a moment or two, then turn it and when sufficiently solid lift it out on a slice, then mix up the yolk with some sugar, add the boiling milk, mix and boil again for a few minutes, then pour around the white and serve.

Gruel.—Mix two tablespoonfuls of oatmeal very smooth in a little cold water, then add it gently to half a pint of water, put it on a fire, and boil for a quarter of an hour, stirring constantly; then flavor with lemon peel, sugar, nutmeg, etc., according to taste, and strain through muslin while hot.

Sago requires to be soaked a little while before using; an ounce should be placed in a pint of water and stood on the hob or in the oven for two hours; then boil for a quarter of an hour, and flavor to taste.

Custard Pudding. Break an egg into a teacup, and mix thoroughly with sugar to taste; then add milk to nearly fill the cup, mix again, and tie over with a small piece of linen; place the cup in a shallow saucepan half full of water, and boil for ten minutes.

If it is desired to make a *Light Batter Pudding* a teaspoonful of flour should be mixed in with the milk before tying up.

Rice Blancmange.—Simmer half a pint of milk with a tablespoonful of pounded white sugar until near boiling, then stir in two ounces or one large tablespoonful of ground rice previously mixed with half a pint of milk till smooth, boil for ten minutes, stirring all the while, and pour into a moistened mould, and serve it cold.

Cornstarch Pudding.—Take a pint of milk and boil it, then stir two tablespoonfuls of cornstarch previously dissolved in milk or water into the boiling milk, flavor to taste, then boil the whole two minutes; allow it to cool in a mould, and serve up with or without jam.

Barley Water.—Take two ounces of pearl barley, and having washed it twice in cold water, boil for twenty minutes in a pint and a half of water; strain, and flavor with lemon peel, sugar, etc., to taste.

Toast Water. Take a slice of stale bread or bottom crust of loaf, toast it carefully without burning, put it in a jug, and pour over it boiling water; let it stand to cool.

Linseed Tea.—To half an ounce of unbruised linseed, with a drachm of liquorice, in a covered jar, add a pint of boiling water; let the infusion stand on the hob or near the fire for three or four hours; strain and flavor to taste.

Rice Water.—Wash an ounce of rice in a strainer with cold water, then put the washed rice with an inch of cinnamon stick into a stewpan with a pint of boiling water, boil for an hour, then strain, and sweeten to taste.

Apple Water.—Take six peeled apples, quarter them, take out cores and pips, and cut into thin slices; put them, with the rind of half a lemon cut very thin and an ounce of loaf sugar, into a jug, pour on a quart of boiling water and let stand to cool.

Tamarind Water.—A very refreshing drink may be made by adding a pint of hot water to a tablespoonful of preserved tamarinds, and setting aside to cool.

PEPTONIZED FOODS.

Many advantages are to be obtained in sickness and convalescence by the use of these articles.

Peptonized foods must not, however, be confounded with the numerous so-called beef extracts, meat extracts, fluid beef, and sundry other preparations. These are of little value, as nutrients, for they contain only the expressed juice (water) of lean meat, which is boiled down to a sort of jelly. Lean beef or mutton, according to the latest and best authorities, contains 75 per cent. of water, holding in suspense some of the salts and solid particles of blood, and these only can be extracted. When the manufacturers of these so called beef extracts, claim that these ingredients constitute the nutritive principles of lean meat, they simply assert what every physiologist knows is not so. In order to receive the benefits of beef, the latter itself must be given, and not some of the substances it contains.

MOSQUERA'S BEEF MEAL.

The object of resorting to "peptonized foods" is mainly to relieve the stomach and other digestive organs of a labor they would other-

wise have to perform, and of all the various articles now upon the market, we know of none which merits the high praise it has secured from the medical profession, and trained nurses, as the peptonized food, known as "Mosquera's Beef Meal." This is not a ready prepared food, but requires the addition of boiling water and seasoning, in the shape of salt, etc. The quantity of water is immaterial, and common sense must be exercised, as the exigencies may call for. It can be used, however, in many other forms, and be incorporated in numerous dishes, such as soups, broths, stews, etc.

By adding it to bean, tomato, or chicken soup, these articles of diet become of extreme nutritive value. Stirred in oatmeal, cracked wheat, pearl barley, and such like, it makes a valuable dish for the first meal of the day. Another way of preparing it, is to cook the beef meal in the form of mush, seasoning according to taste, spreading it upon nicely browned toast; serve hot.

This peptonized food is not only for the sick and convalescent, but the following can be recommended to all who appreciate something toothsome:

Take of "Mosquera's Beef Meal" and bread crumbs equal quantities, beat up one egg and add to meal and crumbs, forming a fairly solid mass; season with salt, add a very little cayenne pepper a sprig of parsley, and a little onion, both chopped fine; form into balls, and steam or boil in water (the water should boil before the balls are placed therein). Serve hot with cream sauce.

Another Way.—Take of "Mosquera's Beef Meal" such quantity as may be required, and add to it just enough boiling water to form a medium solid dough, season with salt, cayenne pepper, finely chopped parsley, and onion, and make into balls about the size of English walnuts; turn these in egg and cracker meal, and fry in very hot unsalted butter, to a nice light brown; place them upon slices of dry bread, which will absorb nearly all the grease. Serve hot.

Served in this form, "Mosquera's Beef Meal" will never be forgotten, and be always received with welcome by the palate, and with thanks by the digestive organs, because the latter have hardly any labor in transforming it into blood. In fact, in all its forms, it is not only a relish, in which the highest nutritive principles have been incorporated, but also a luxury which can be purchased at comparatively little cost.

MOSQUERA'S BEEF CACAO.

This is a mixture of beef meal, cacao and sugar. The taste of the former is disguised by the two latter. While a patient may have

a craving for cacao, this preparation should be given, as it contains the highly nutritive beef.

It is prepared like other cocoa or chocolate, with water or milk, or half and half. It is very nourishing, and easily assimilable.

In concluding this subject of nursing, we wish to recapitulate a few of the important suggestions to the nurse, and will say first, above all things, don't fail in being cheerful under all circumstances possible.

Don't speak of the symptoms of your patient in his presence.

Don't contradict your patient.

Don't let your patient see you are annoyed.

Don't whisper in the sick room.

Don't allow others to do it.

Don't fail to keep the room bright, unless it is necessary that it should be otherwise.

Don't fail to let in the pure air and sunshine.

Don't fail in keeping everything in order.

Don't bustle. Don't be fussy.

Don't dust with a dry cloth; use a damp one.

Don't fail to empty all vessels immediately; wash and return to their proper place.

Don't leave the patient's food by his side hoping that he will eat it by and by; the longer it remains the less likely he is to taste it.

Don't keep medicine standing where the patient can see it.

Don't mix the medicine in the patient's sight.

Don't use your finger to stir medicine with.

Don't taste either medicine or nourishment in the patient's presence.

Don't forget, "That we have no power of ourselves, to help ourselves," but that the Heavenly Father is ever willing to grant us strength to perform our duties, if we ask it of Him in the name of the Blessed Saviour.

CHAPTER XVI.

DOMESTIC RECIPES.

KOUMISS.

The late Professor Gross, after advising the class of the utility of Koumiss as a nutriment during inflammatory processes, gave the following directions for preparing it:

Dissolve a half ounce of grape sugar in four ounces of water. Dissolve twenty grains of yeast cake in four ounces of milk. Pour both into a quart bottle and fill nearly to the top with milk. Cork tightly, fasten the cork with wire. Put in a cool place and shake two or three times daily for three days. Keep for use no longer than six days.—*C. and C. Record.*

Koumiss is usually sold at fifty cents per quart bottle in drugstores. By following above directions and making it yourself, it will cost less than five cents.

LIME WATER.

Lime water has many virtues as a remedy being antacid, tonic and astringent. It is prepared as follows:

Take of *unslacked lime* two ounces and put it into a bottle containing one quart of pure water, allow the lime to slack and after cooled down add one more quart of pure water; shake well for two or three minutes. After ten or twelve hours the insoluble part will all have precipitated and the clear liquid may be drawn off by means of a siphon or by tilting the bottle, which may then be put away for use when needed.

CARBOLIZED WATER.

A very useful preparation which every family should have in the house. It serves its purpose in cleansing wounds, either upon the human or animal body, hollow teeth, etc. It also allays the pain incident to bites from mosquitoes, wasps, bees, and other insects. A

cloth moistened with carbolized water and placed on sores, boils, carbuncles, gives much relief. It is made as follows:

Take of

Carbolic Acid..... ½ oz.
Glycerine..... 4 fl. ozs.

Mix these well together in a cup or bowl till the acid is entirely dissolved, then add to it three pints distilled water; shake and keep in well stoppered bottles.

CARBOLIZED OIL.

There is no better remedy than the application of carbolized oil to healing sores, cuts, wounds and abrasions of all kinds. It will disinfect the wound and assist in healing. It is prepared by adding one ounce of carbolic acid, chemically pure, to fifteen ounces of sweet oil. Shake, and when acid is dissolved it is ready for use. Keep in well stoppered bottle.

CAMPHORATED OIL.

Take of

Camphor..... 1 oz.
Olive Oil..... 4 ozs.

Dissolve the camphor in the oil. This preparation is also called "camphorated liniment."

By adding to the above substances ¼ ounce of chloroform, an excellent liniment is produced, which will allay almost any kind of pain.

MUCILAGE OF SLIPPERY ELM BARK.

A very useful preparation, which is used as a demulcent or nutritious drink, in catarrh, kidney and intestinal troubles. It is also used as a local demulcent in inflammation of the skin. Prepare as follows:

Slippery elm bark, sliced and dried, 6 parts; boiling water 100 parts. Macerate for two hours in a covered vessel and strain.

EXTRACT OF GINGER.

Take of ground ginger one pound, and mix with it one pint of alcohol. After leaving this mass in a closed vessel for a few days, strain through filtering paper, after having added another pint of alcohol to the mixture. If you have a mortar or a fine coffee mill, and grind the ginger roots yourself, you will have a better extract.

ESSENCE OF PEPPERMINT.

Take oil of peppermint, 11 fluid drachms; peppermint in coarse powder, 40 grains; alcohol in sufficient quantity to make one pint in all. First dissolve the oil of peppermint in 90 parts of the alcohol. Then add the peppermint powder. Let it stand for twenty-four hours, then filter it through paper, and add sufficient alcohol to make one pint.

SPIRIT OF CAMPHOR.

To make a pint of this useful household remedy, take of gum camphor, 1½ ounces; alcohol, ¾ pint, and water, 1 gill. Dissolve the camphor in the alcohol, add the water and filter through paper.

ESSENCE OF LEMON.

To make this delicious flavoring extract, take ½ fluid ounce of oil of lemon; freshly grated lemon peel, ½ ounce, and alcohol to make ½ pint in all. Dissolve the lemon oil in nine-tenths of the alcohol. Add the lemon peel, macerate for twenty-four hours; then filter through paper, adding through the filter enough alcohol to make one-half pint in all. Keep in well stoppered bottle.

MUCILAGE.

In making one-half pint of this useful article, take of pure gum Arabic, two ounces. Wash it in cold water and add to it not quite a half pint of pure water. Agitate occasionally till completely dissolved. Then strain through muslin if not clean. If glycerine is used in proportion of one to eight of the water, and added to the gum when dissolved, shaking it well, the mucilage will not spoil.

SALVES AND OINTMENTS.

RESIN SALVE.

Take of *resin* 1¾ ounces, *yellow wax* ¾ ounce, *lard* 2½ ounces. Melt them together at a moderate heat, strain the mixture through muslin and allow it to cool without stirring.

This salve is an excellent remedy for blistered surfaces, indolent ulcers, burns, scalds and chilblains.

CARBOLIC OINTMENT.

Take pure lard, two ounces; of yellow wax one-half ounce. Melt the wax and add the lard gradually; then stir the mixture constantly until cool. Add to this seventy-two grains of carbolic acid, C. P. Mix thoroughly with the base.

This is a preparation, when once tried, will recommend itself in the healing of all sorts of wounds, bruises, etc.

TAR OINTMENT.

Take of tar one ounce, and of suet one ounce. Mix the tar with the suet previously melted at a moderate heat; strain the mixture through muslin while hot. Stir constantly until cool.

This ointment is highly useful as a stimulant application in various scaly and scabby eruptions, particularly in psoriasis and "scald head." In the last named affection it should be applied night and morning, and in bad cases the patient should constantly wear a cap thickly coated internally with the ointment.

FOMENTATIONS.

POPPY.

Take two poppy heads, break them up and boil in two pints cold water until the quantity is nearly reduced to one pint, then strain; soak the flannel in the decoction, wring out superfluous moisture and apply hot, covering all with a piece of water proof.

TURPENTINE.

The flannels should be wrung out in hot water and then the surface of them should be sprinkled with about half an ounce of turpentine.

OPIUM.

The same as turpentine, with the substitution of laudanum for turpentine.

WHITE LINIMENT.

The ingredients of this most excellent liniment are:

3 eggs.
1 pint good vinegar.
3 fluid ounces turpentine.
3 fluid ounces spirits of camphor.

Beat the eggs (both white and yolk) until smooth. Add slowly, first the turpentine, secondly the vinegar, and lastly the camphor, stirring all the while. Put them in well corked bottle, shaking it twice or three times a day for two days, after which it will be ready for use.

This is an excellent liniment for sores, burns, cuts, etc. It will cure scratches upon the horse. The cost of the substances used need

not exceed fifteen or twenty cents, and will go farther and effect more cures than five dollars worth of patent liniments.

POULTICES.

Poultices or cataplasms as the medical fraternity are wont to call them, are moist substances intended for external application of such a consistence as to accommodate themselves accurately to the surface to which they are applied, without being so liquid as to spread over the neighboring parts, or so tenacious as to adhere firmly to the skin.

CHARCOAL POULTICE.

Take of powdered wood charcoal one-half ounce. Crumbs of bread two ounces. Linseed meal one ounce and a half. Boiling water ten fluid ounces (a little more than half a pint). Soften the bread in the water for ten minutes near the fire, then mix in the linseed meal gradually, stirring it constantly, that a soft poultice may be formed. Mix this with half the charcoal and sprinkle the remainder on the surface.

YEAST POULTICE.

Take of beer yeast six fluid ounces, wheaten flour fourteen ounces, water heated to 100 degrees Fahrenheit six fluid ounces. Mix the yeast with the water and stir in the flour. Place the mass near the fire till it rises, and apply.

LINSEED POULTICE.

Take of linseed meal four ounces. Boiling water, ten fluid ounces. Mix the linseed meal gradually with the water and apply. Dip the knife or spoon with which you spread the poultice in boiling water; it will prevent the mass from sticking to it.

MUSTARD POULTICE.

Take of mustard in powder two ounces and mix it with the white of two eggs to a proper consistency. By using the white of an egg, mustard plaster will not draw blisters.

When the exhibition of this remedy is necessary, we would advise our readers to use the prepared mustard plasters, procurable in all drugstores, and so much more ready for use.

CORNMEAL POULTICE.

Take of cornmeal six ounces; boiling water, half a pint. Mix the meal into water while boiling.

BREAD AND SOAP POULTICE.

Take two ounces of dry wheat bread and moisten it in as little hot water as possible; add to it one teaspoonful of brown sugar, and one ounce of finely shaved castile soap. Mix well and apply warm.

BREAD POULTICE.

This poultice should be made by first grating a sufficient quantity of stale bread crumbs; this should be added to boiling water in a basin, carefully stirring all the while until a proper consistency is obtained; the resulting mass should be poured onto the muslin or other material prepared to receive it, and should not be spread or pressed in any way.

ENEMATA OR CLYSTERS.

Under these terms is meant the injection of liquid into the lower intestine, the rectum, for different purposes.

1. To evacuate the bowels, as in case of constipation.
2. To alleviate pain, as in case of diarrhœa.
3. To administer nourishment or medicines in cases where the stomach rejects these.

To aid a passage of the bowels, the following may be used:

Water of a temperature of 90 degrees Fahrenheit.

Water to which a teaspoonful of salt has been added.

Water in which a small quantity of castile soap has been dissolved.

Water to which a tablespoonful of olive oil has been added.

Water to which two tablespoonfuls of vinegar have been added.

All these should be used at a temperature of about 90 degrees Fahrenheit, not higher. The quantity must be regulated according to circumstances. But it is safe to follow the following rules:

For babies, a small teacupful

For children, ½ to 2 cupsful.

For adults, 3 to 5 cupsful.

To alleviate pain, as in case of colic, diarrhœa, the following are applicable:

CHAMOMILE CLYSTERS.

Take a handful of the flowers, steep them in the requisite quantity of water, strain and administer.

VALERIAN CLYSTERS.

Take two drachms of the tincture of valerian for the adult dose; for children, in accordance with the dose table.

CLYSTER OF OPIUM.

Take of corn starch sufficient quantity boiled in hot water to the consistency of mucilage and add for an adult dose one-half fluid drachm of laudanum. This is equal to thirty drops. Children in proportion according to dose table.

If the chamomile and valerian cylsters are designed to stop diarrhœa, it is well to prepare them with mucilage of starch.

CHAPTER XVII.

MISCELLANEOUS TOILET RECIPES.

ANTISEPTIC TOOTH POWDER.

Boric Acid (finely powdered)	40 grs.
Chlorate of Potassium	30 grs.
Powdered Guaiacum	20 grs.
Prepared Chalk	60 grs.
Powdered Carbonate of Magnesia	1 oz.
Attar of Roses	½ drop.

The above ingredients, in the quantities as given, make an excellent tooth po der. It will sweeten the breath, it detaches the particles of tartar which may be present, and polishes the enamel of the teeth without doing harm to it. The ingredients should be well mixed before being used.

SHAMPOOING.

Nothing is perhaps so refreshing as a good shampoo. It will open the pores of the skin, remove all dirt, and give to the hair a peculiar beautiful luster.

The following two recipes for sea foam, when prepared at home, cost but a trifle, and almost everybody can enjoy the luxury of a scalp wash, without paying to the barber or hair dresser fifty cents.

Glycerine	1 oz.
Aqua Ammonia	2 ozs.
Alcohol, 95 per cent	16 ozs.
Water enough to make	32 ozs.

Mix thoroughly, and if you wish add such perfume as you may like.

The following will do the same as the last, but is slightly more complicated, and costs a trifle more.

Alcohol	8 ozs.
Water	8 ozs.
Soap, Castile	2 ozs.
Carbonate of Potassa	½ oz.
Oil of Lavender	20 drops.
Tincture of Soap Bark	2 ozs.

Mix the alcohol and tincture, in which dissolve the oil. Dissolve carbonate of potassa in the water and the soap. Mix the two solutions.

ROUGH SKIN, CHAPPED HANDS, ETC.

Ladies as a rule, and gentlemen with but few exceptions, are proud of the possession of a fair and smooth skin, and those who are not so favored wish for it.

In a majority of cases rough skin, chapped hands, and such like are the result of exposure, inferior soap, hard water, insufficient drying, and many other causes.

When so afflicted the application of some *cold cream* will readily remedy the ailment. When this article, however, has to be purchased from your druggist it is rather expensive, and for this reason we give detailed descriptions how to prepare several of these creams. The substances can be purchased from almost any druggist for a mere trifle, and should the quantity be too large we would advise that one, two or three families join together and thus divide the expense and also the cold cream.

Any of the following preparations will preserve the skin and prevent "chapping"

COLD CREAM.

White Wax	6½ drachms.
Spermaceti	6½ drachms.
Oil of Almonds, expressed	6½ ounces.

Melt the above articles, and when the mixture is upon the point of congealing add the following under constant stirring with a patent egg beater:

Borax (previously dissolved in 3 fl. drachms. distilled water)	25 grs.

Then add:

Cumarin	⅓ gr
Oil of Rose	10 drops.
Oil Neroli	3 drops.
Oil Geranium	2 drops.
Oil Ylang Ylang	1 drop.
Oil Orris	⅓ drop.
Tincture Ambergris	1 drop.

The above makes 12 ounces of cream. It is best preserved in well closed jars, and should be kept in a cool place.

GLYCERINE COLD CREAM.

White Wax	7 drachms.
Spermaceti	7 drachms.
Oil of Almonds	7 ounces.
Glycerine	7 drachms.

Melt the above and proceed as in the foregoing, then add under constant stirring ten (10) fluid drachms of distilled water in which (25) grains borax have been dissolved, and add all the other articles of the foregoing, commencing with cumarin, etc. If you desire this cream to be of a red color, dissolve three grains *alcanin* in the almond oil which will give it a beautiful healthy flesh tint.

CAMPHOR COLD CREAM

Is prepared like the ordinary cold cream as given in previous directions, but adding to white wax and spermaceti when on the fire to melt, four drachms of camphor.

Of the numerous toilet waters we can recommend the following not only on account of their cheapness when prepared at home, but also for their beauty of odor, without containing deleterious substances.

FLORIDA WATER.

Oil of Lavender	1 fl. oz.
Oil of Bergamot	1 fl. oz.
Oil of Neroli	½ drachm
Oil of Orange	1 "
Oil of Clove	¼ "
Pure Musk	1 gr.
Cologne Spirit, 96 per cent	1 qt.
Tincture of Tonka sufficient to color.	

Macerate fifteen days and filter through paper.

GLYCERINE TOILET WATER.

Borax	150 grs.
Oleo Saccharate Cumarin	15 grs.
Glycerine	2 ozs.
Rose Water	1 qt.
Tincture of Amber	2 drops.
Oil of Rose	5 drops.
Oil of Neroli	1 drop.

Add a sufficient quantity of solution of carmine to give it such color as may be desired.

Dissolve the borax and oleosaccharate of cumarin in the water, to which add the glycerine and other ingredients with sufficient carmine solution to give the mixture a faint red color; then filter.

Either rose or orange flower water are grateful perquisites to the toilet table. They are prepared as follows:

ROSE WATER.

Oil of Rose	8 drops.
Carbonate of Magnesium	20 grs.
Water, sufficient to make	1 pt.

Rub the oil of rose with the carbonate of magnesium in a mortar and gradually add the water; then filter.

ORANGE FLOWER WATER.

Oil Neroli	32 drops.
Carbonate of Magnesium	60 grs.
Water, sufficient to make	2 pts.

Rub the oil with the carbonate of magnesium in a mortar, gradually add the water, and filter.

GERMAN COLOGNE.

This delicious and fragrant toilet water would be more used were it not for the exorbitant charges made therefor at druggists and other stores. By preparing it yourself it costs but a trifle. Cologne water is often useful in the sick room as a refreshing perfume. Take of

Alcohol	1¼ gallon.
Oil Bergamot	1 ounce.
Oil Lemon	1 ounce.
Oil Neroli	¼ ounce.
Oil Sandal Wood	¼ ounce.
Camphor	30 grains.

Mix thoroughly and let it stand for fourteen days, when it will be ready for use. It should be kept in well stoppered glass bottles.

Many a gentleman would prefer to shave himself, if he had the requisites to give to his moustache or beard that glossy appearance which his tonsorial artist so dexterously applies.

The following is a formula for a

BRILLIANTINE,

Which will impart to the beard a glossy appearance, and is also a good tonic for the hair, making it soft and strong.

Castor Oil	1½ ounce.
Glycerine	½ ounce.
Alcohol	5 ounces.

Add such perfume as may be agreeable. Oil of Jasmine or Neroli, one or two drops of each or singly, is considered by many as an exquisite odor.

USEFUL RECIPES.

By preparing the following household articles yourself, you will save in one year more money than this work has cost you.

A STRICTLY PURE BAKING POWDER

Is made as follows:

Cream of Tartar	22 oz.
Bicarbonate of Sodium	10 oz.
Tartaric Acid	150 grs.
Wheat Flour	8 oz.

Rub the ingredients, which should be perfectly dry, together in a mortar and pass them through a sieve. Keep in well closed bottles or tin boxes.

The above will make about 2½ pounds at a cost of sixty cents.

LAUNDRY BLUEING.

Take of *Prussian blue* three ounces and of *oxalic acid* one-half ounce. Dissolve the oxalic acid in a little water, add the Prussian blue, and finally sufficient water to make it the desired strength.

FURNITURE POLISH.

The following "recipe" has been used quite extensively, and we can personally vouch for its efficacy in "making old furniture look like new." Take of

Linseed oil, boiled	3 oz.
Alcohol	5 oz.
Hydrochloric acid	2 dr.

Mix the oil with the alcohol, then add the acid. Add some red saunders to color if desired. Shake well before using, apply lightly and rub with a piece of flannel until dry. The small proportion of acid helps to cut the dirt.

DISINFECTANT LOTION.

Take of chloride of zinc 400 grains and dissolve it in two ounces of water.

When you want to use this preparation add one ounce of this solution to two pints of water, or less in proportion. To disinfect a sick room, a piece of flannel ¾ foot square is to be moistened with the diluted solution, and frequently waved through the air. Some of it can be advantageously placed in the stools and bed pan.

COPPERAS.

This article is also known as sulphate of iron, and possesses decided disinfecting properties, and is recommended for purifying water closets, outhouses, night stools, and such like. In order to get full value it must be dissolved by one pound of copperas in four gallons of water, using the solution as may be required.

GERMAN PUTZ POMADE.

This is an excellent article to polish door plates, brass or nickel faucets, or any metal goods about the house. Take of

Pumice Stone Powder	2 ounces.
Rotten Stone	2 ounces.
Iron Subcarbonate	4 ounces.

Olive oil in sufficient quantity to make a paste. Perfume with a few drops of nitro benzole.

Care should be taken that the dry ingredients are reduced to an impalpable powder, otherwise scratches will ensue.

CEMENT FOR MENDING CHINA.

This useful article is made as follows:

Curd of milk, dried and powdered	5 oz.
Quick lime	½ oz.
Camphor	1 dr.

Mix and keep in closely stoppered bottles. When wanted for use a portion is to be mixed with a little water into a paste.

CEMENT FOR EARTHEN AND GLASSWARE.

Dissolve gum shellac in alcohol, apply the solution, and bind the parts firmly together until the cement is dry.

TO MEND IRONWARE.

Sulphur	2 oz.
Black lead	1 oz.

Put the sulphur in an iron pan over a fire until it melts; then add the lead; stir well, then pour out. When cool break into small pieces. A sufficient quantity of this compound being placed upon the crack of the ware to be mended, can be soldered by a hot iron.

INDELIBLE INK FOR MARKING.

Nitrate of Silver	½ oz.
Water	3 oz.
Gum Arabic	½ oz.

Dissolve and keep in dark bottle. Apply with goose quill or gold pen. Steel pens are liable to be ruined.

GLOSSARY.

Abdomen.—The lower half of the body, from the chest to the groins.
Abscess.—A collection of matter.
Acupuncture.—The insertion of needles into the living tissues for remedial purposes.
Ammoniacal.—Smelling like ammonia.
Anæsthesia.—Insensibility to pain.
Anasarca.—A collection of serum in the connective tissues.
Anatomy.—The knowledge of the different parts of the body which is gained by dissection.
Aneurism.—A tumor containing blood—caused by some defect in the coats of an artery with which it communicates.
Anodynes.—Remedies used to procure relief from pain.
Anthelmintic.—Antagonistic to worms, worm-expelling medicine.
Antipyretic.—Opposed to fever—cooling medicine.
Antiseptic.—Able to prevent putrefaction.
Anorexia.—Loss of appetite for food.
Antrum.—A cave—a name usually applied to part of the upper jaw.
Aorta.—The large artery arising from the left side of the heart to supply all the body with blood.
Aphonia.—Loss of voice.
Apoplexy.—Sudden insensibility caused by disease within the brain.
Aqua.—Water.
Arteries.—Tubes through which purified blood flows from the heart to the body generally.
Ascaris.—A worm; ascaris lumbricoides, long round worm; ascaris vermicularis, thread-worm.
Ascites.—Dropsy.
Asphyxia.—Suffocation.
Asthma.—A disease marked by spasms of difficult breathing.
Astragalus—One of the bones of the foot
Atresia.—Absence of natural opening or passage.
Atrophy.—Wasting.
Auscultation.—Listening.
Autopsy.—A post-mortem examination.
Axilla.—The armpit.
Balneum.—A bath: tepidum, warm; calidum, hot; frigidum, cold.
Battery.—An apparatus for producing electricity.
Bile.—A yellow fluid formed in the liver.
Bistoury.—A curved knife (sharp or probe-pointed.)
Bougie.—An instrument for dilating contracted passages

Bronchitis.—Inflammation of the bronchial tubes.
Bubo.—A suppurating gland in the groin.
Cæcum.—The name of part of the large intestine.
Calculus.—A pebble—usually applied to stone in the kidney or urinary bladder, or to concretions of bile in the gall-bladder.
Cantharides.—Spanish fly, from which blisters are made.
Canula.—A funnel-shaped tube, acting as a sheath for a trocar.
Caoutchouc.—India-rubber.
Capillary.—Like a hair in size—the small bloodvessels which intervene between the arteries and the veins.
Caries—Decay—usually applied to bones and teeth.
Cardiac.—Belonging to the heart.
Carpus.—The wrist.
Cartilage.—Gristle.
Catalepsy.—A disease in which (during the attack) the limbs remain in any position in which they may be placed.
Cataract.—A cloudiness or opacity of the lens of the eye.
Catarrh.—A watery discharge.
Cataplasm.—A poultice.
Catheter.—An instrument for drawing water from the bladder.
Catamenia.—The menses.
Caustic.—Any substance which destroys animal textures by chemical action.
Cautery.—An instrument for applying heat.
Cerebrum.—The brain.
Cerebellum.—The little brain.
Cervical.—Belonging to the neck.
Chyle.—The material into which food is transformed before it is absorbed into the blood.
Clavicle.—The collar-bone.
Clinical.—Belonging to a bed; clinical lectures, bedside lectures.
Clonic.—Spasmodic contractions are called clonic when they are of short duration and recur frequently. See *Tonic.*
Cluneluvium.—A hip bath.
Clyster.—An enema.
Coagulation.—The process by which the solid elements of a liquid join and separate from the watery elements; as when milk curdles.
Collyrium.—An eye wash.
Coma.—Insensibility.
Condyle.—A round projection at the ends of some bones.
Congenital.—Beginning at birth.
Contusion.—A bruise.
Convulsion.—Involuntary jerking movements of the limbs and features.
Cornea.—The clear projection, like a watch-glass, on the front of the eye.
Coryza.—Nasal catarrh.
Cranium.—The skull.
Crepitus.—A sensation produced by rubbing together the ends of a broken bone.

Crisis.—A deciding point.
Cuticle.—See *Epidermis.*
Cutaneous.—On the surface of the skin.
Cutis anserina.—Goose skin.
Cyst.—A tumor containing fluid or half-solid material, inclosed within an investing membrane.
Diaphoresis.—Perspiration.
Diagnosis.—The decision as to the nature of the patient's ailment.
Digitus.—A finger or toe.
Diuresis.—An increased flow of urine.
Dorsum.—The back.
Dyspnœa.—Difficulty of breathing.
Ecchymosis.—An effusion of blood under the skin, a bruise.
Eclampsia.—A condition of the body in which there are epileptiform convulsions.
Emetic.—Any means used to produce vomiting.
Empyema.—A collection of pus in the pleural cavity.
Emphysema.—A puffing up or distension by air or gas in the tissues of the body.
Enema.—An injection thrown up into the rectum.
Eneuresia.—Involuntary passage of urine during sleep.
Entozoon.—Any animal living inside another.
Epidermis.—The outermost layer of the skin or cuticle.
Epigastrium.—The region of the stomach
Epiglottis.—The cartilage guarding the entrance to the windpipe.
Epiphysis.—The separate centers at the ends of bones from which growth takes place.
Epistaxis.—Bleeding from the nose.
Erythema.—Any circumscribed reddening of the skin.
Ethmoid.—One of the bones of the skull which helps to form the nose.
Excrement.—Any refuse material excreted from the body.
Expectorate.—To cough up from the chest.
Fæces.—The dregs, the refuse material expelled from the bowels by the anus.
Fascia.—The membrane which incloses the muscles.
Fauces.—The jaws, the back of the mouth.
Femur.—The thigh bone.
Ferrum.—Iron or steel.
Fibula.—The small bone on the outer side of the leg.
Fistula.—A little pipe: a name given to any unnatural passage by which an internal organ communicates with any other or with the external air.
Flatulence.—Wind in the stomach or bowels.
Fomites.—Articles of clothing or bedding which have been in close contact with a patient, and by which infection might be conveyed.
Fœtus.—An unborn child.
Foramen.—A hole.
Forceps.—An instrument for taking hold where the fingers are unsuitable or undesirable.

Galvanism.—Electricity generated by chemical means; a word derived from the name of a discoverer in electric science called Galvani.

Ganglion.—A small swelling in the sheath of a tendon, or an enlargement in the course of a nerve.

Gangrene.—Mortification or death of a part.

Gastric.—Concerning or belonging to the stomach.

Glottis.—The opening into the windpipe.

Globus hystericus.—A feeling peculiar to hysterical people, as of a ball rising in the throat.

Granulation.—The process of healing by several centers, with copious secretion of healthy pus.

Hæmatemesis.—Vomiting of blood.

Hæmaturia.—Blood in the urine.

Hæmoptysis.—Coughing of blood.

Hæmorrhage.—Bleeding, a flow of blood.

Hæmorrhoid.—A pile.

Haustus.—A draught.

Hectic.—A feverish state of the system, attacking patients exhausted by discharges.

Hepatic.—Belonging to the liver.

Humerus.—The bone of the arm.

Hyperasthesia.—Increased sensibility.

Hyperidrosis.—Excessive perspiration—usually used in connection with that condition of the hands or soles of the feet.

Hypertrophy.—Overgrowth.

Hypnotic.—Sleep-producing.

Hypnotism.—Sometimes used to express the condition induced by mesmerism or suggestion.

Hypodermic Injection.—Injection under the skin.

Hypogastrium.—The part of the abdomen between the navel and the pubes.

Inanition.—Wasting from want of food.

Incubation.—Hatching.

Inguinal.—Belonging to the groin.

Intussusception.—An accident by which one part of the gut slips into another, as the finger of a glove when pushed in at the end.

Iris.—The membrane of the eye which regulates the size of the pupil, and whose color is taken as the color of the eye.

Irrigate.—To keep a part moist by causing water or some lotion to constantly drop on it.

Labium.—The lip.

Lachrymal Gland.—The gland in which tears are formed.

Lachrymal Duct.—The tube through which the tears pass from the eye to the nose.

Larynx.—The upper part of the windpipe.

Laryngoscope.—An instrument for examining the interior of the larynx.

Lesion.—An injury accompanied by loss of substance.

Ligaments.—Bands of connective tissue.

Ligature.—A string or cord for tying.
Lingual.—Belonging to the tongue.
Lithotomy.—The removal of a stone from the bladder by a cutting operation.
Lithotrity.—The operation of crushing a stone in the bladder.
Malleolus.—The ankle.
Mamma.—The breast.
Macerate.—To soften by steeping in a liquid, with or without heat.
Maxilla.—The jaw.
Meatus.—A passage or opening.
Menses.—The monthly discharge from the womb.
Menstrual.—Belonging to the above.
Mesenteric.—Belonging to the mesentery—the fold of peritoneum that keeps the bowel in place.
Metacarpus.—The bony floor of the palm of the hand.
Micturition.—The act of making water. Urinating.
Midwife.—A woman who assists at the delivery of women in childbirth.
Narcotic.—Producing sleep.
Nares.—The nostrils.
Nasal.—Belonging to the nose.
Necrosis.—Death of any part of the body—usually applied to bones.
Normal.—Natural, ordinary.
Nucleus.—A central point.
Obesity.—Corpulence.
Obstetric.—Relating to childbirth.
Occiput.—The back of the head.
Œdema.—Watery swelling.
Œsophagus.—The gullet.
Olfactory.—Relating to the organ of smell.
Omentum.—The apron of fat in front of the intestines.
Ophthalmic.—Concerning the eye.
Ophthalmoscope.—An instrument for examining the eye.
Opisthotonos.—A bending backward of the whole body caused by a simultaneous muscular contraction.
Optic.—Concerning the sight.
Orthopædic Surgery.—The branch which treats distortions.
Orthopnœa.—A state of the body in which the patient can only breathe when the body is upright.
Otorrhœ.—A discharge from the ears.
Otoscope.—An instrument for examining the ears.
Ovariotomy.—Removal of the ovary by a cutting operation.
Parasite.—Any plant or animal living on another.
Paresis—A slight or imperfect paralysis of motion.
Paroxysm.—A fit.
Patella.—The knee-cap.
Pathology.—The study of the nature of disease.
Pelvis.—The lower part of the abdomen.
Perineum.—The part of the body just in front of the anus.
Phagedæna.—Sloughing ulceration.
Pharmacopœia.—A list of remedies and their mode of preparation.

Pharynx.—The beginning of the gullet or food passage.
Phlebitis.—Inflammation of a vein.
Phlebotomy.—The act of bleeding by opening a vein.
Photophobia.—Intolerance of light.
Physiognomy.—The expression of the features and face generally.
Placenta.—The after-birth.
Plethora.—Fullness—an excess of blood.
Pleura.—The bags which inclose the lungs.
Pleurodynia.—Pains in the side.
Plexus.—A network.
Probang.—An instrument for removing obstructions in the throat.
Probe.—A small instrument like a bodkin for trying the direction of a wound, etc.
Prognosis.—The opinion as to the result of an illness.
Prolapsus.—A slipping down.
Ptosis.—A dropping of the upper eyelid.
Ptyalism.—Excessive secretion of saliva.
Pulmonary.—Belonging to the lungs.
Pulse.—The rise and fall of the arteries with each beat of the heart.
Purgative.—Producing an action of the bowels.
Purulent.—Containing pus.
Pus.—A yellow creamy fluid present in abscesses and on the surface of healthy granulating wounds (*matter.*)
Pustule.—A small circumscribed collection of matter between the two layers of the skin.
Pyæmia.—A disease in which the blood is poisoned.
Pylorus.—The opening of the stomach into the intestine.
Pyrosis.—An eructation of watery fluids into the mouth (water-brash.)
Quartan Ague.—An ague in which the attack recurs every third day.
Quiescent.—At rest.
Ranula.—A small watery tumor under the tongue.
Ricini oleum.—Castor oil.
Rugæ.—Wrinkles.
Saccharine.—Containing sugar.
Saliva.—The spittle.
Sal volatile.—Aromatic spirits of ammonia.
Scalpel.—A knife.
Scybala.—Small lumps of hardened fæces.
Sebaceous.—Like suet.
Secretion.—A natural function by which various fluids are separated from the blood—also the fluid separated or secreted.
Septum.—A partition.
Sequestrum.—A piece of dead bone.
Serum.—The watery part of the blood.
Serous Membrane.—A membrane which secretes or gives out serum.
Shingles.—An eruption of the skin (herpes) due to nerve irritation.
Sinapism.—A mustard plaster.
Spatula.—A blunt knife for spreading plasters or poultices, and also an instrument for keeping soft parts out of the way during an operation or examination.

Spasm.—A temporary contraction of a muscle.
Specific Gravity.—The measure of the density of a fluid in comparison with that of water.
Speculum.—An instrument for facilitating the examination of cavities.
Sphacelus.—Mortification or gangrene of soft parts.
Sphincter.—A muscle for closing.
Sphygmograph.—An instrument for taking traces of the pulse.
Spiculum.—A splinter or small piece of bone.
Stethoscope.—An instrument for listening to the sounds of the heart and lungs.
Stricture.—A contraction or narrowing of a passage.
Styptic.—Anything useful for stopping bleeding.
Suture.—A stitch. Also applied to the interlocking of the bones of the head.
Synovia.—The lubricating fluid found in all joints.
Syncope.—Faintness.
Tarsus.—The bones which form the heel and back part of the foot.
Tenaculum.—A small hook for passing under arteries previous to securing them.
Tendon.—A sinew.
Tenotomy.—The operation of dividing tendons.
Thorax.—The chest.
Thyroid Cartilage.—The prominence in the upper part of the neck in front, called commonly Adam's Apple.
Thyroid Gland.—A gland in front of the neck, frequently enlarged in young women.
Tibia.—The shin-bone.
Tonic.—Medicine to increase the appetite for food; also involuntary contractions of the muscles, which are of long duration, are said to be tonic. (*See clonic.*)
Trachea.—The windpipe.
Tracheotomy.—The operation of making an artificial opening into the windpipe.
Transfusion.—The injection of blood from the veins of one person into those of another.
Trephine.—A small saw for removing a circular portion of bone.
Trocar.—A stiletto used for tapping.
Tubercle.—A small projection.
Tumor.—A swelling.
Ulna.—The bone on the inner side of the fore-arm.
Umbilicus.—The navel.
Urethra.—The passage through which the urine escapes from the bladder.
Uvula.—The small body which hangs down at the back of the mouth.
Viscus.—(sing.), *Viscera* (plural), The entrails.

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